

THE JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS



PUBLIC UTILITY DEPRECIATION ACCOUNTING

L. R. NASH

SYMPOSIUM ON IOWA LAND VALUE APPRAISALS

HENRY A. WALLACE, GRIFF JOHNSON,
ALBERT G. BLACK AND JOHN D. BLACK

REPRODUCTION COST AND DESIRABLE PUBLIC UTILITY REGULATION

JOHN BAUER

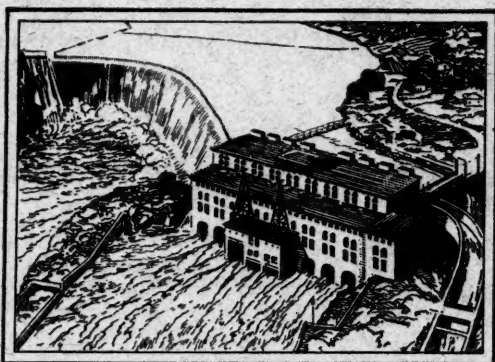
THE FINANCING OF NON-GOVERNMENTAL IRRIGATION ENTERPRISES

R. P. TEELE

VOLUME II - NUMBER 4

OCTOBER 1926

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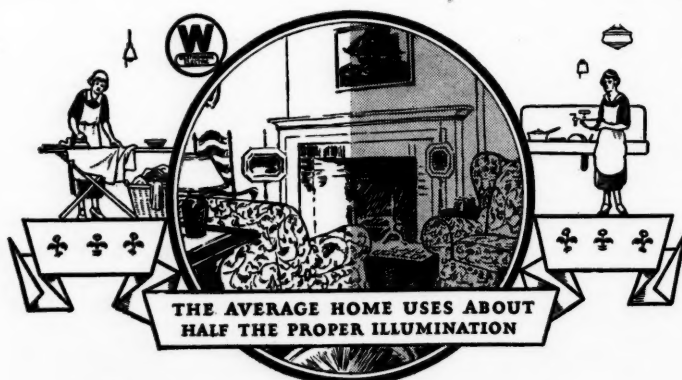
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THE JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS

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THE JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS

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NUMBER 4

PUBLIC UTILITY DEPRECIATION ACCOUNTING

By L. R. NASH

ALTHOUGH the major developments in public utility service have occurred within the last 30 or 40 years, the investment in those classes devoted largely to local service, including electric light and power, electric railway, gas, and communication companies, already exceeds that in any other group of industrial activities except railroads. The investment in electric power, railway, and gas industries each exceeds that in any group of manufactures, of which iron and steel foundries and rolling mills are the largest.

Accounting Systems

In spite of such rapid expansion and vast proportions, the accounting methods of public utilities have only very recently become generally standardized. The first attempts at such standardization were made in 1909, when the Interstate Commerce Commission pre-

scribed a system of accounts for interstate electric railways. About this same time state regulation of local utilities, including the right to prescribe accounting methods, began its broad application. The state commissions having jurisdiction over electric railways promptly adopted in substance the accounting system prescribed for interstate properties.

No such precedent existed for other classes of utilities, and each state commission which prescribed accounting methods developed its own system. Naturally, the systems in effect in different states, although embodying recognized basic principles, differed widely in many details. This diversity occasioned much confusion and annoyance for properties operating in more than one state or when a group of affiliated properties operating in widely separated localities wished to make detailed comparisons of their results.

This situation was not ignored by the state commissions, and in due time a committee representing these commissions and the national organizations of the electric and gas industries developed uniform systems of accounts for these utilities which were approved in 1922 by the unofficial organization of the members of the state commissions. These classifications have since been formally adopted by the commissions in more than two-thirds of the states which have authorized accounting supervision, and further adoption is in prospect.

The interstate railway classification of accounts and the systems prescribed by the state commissions for local utilities are, in general, similar because both necessarily recognize corporate accounting principles in common use. The interstate and state systems, however, differ fundamentally with respect to one factor, depreciation, with which this paper deals.

The interstate system assumes that utility property is uniformly consumed in public service and that its cost, less salvage, should be accumulated during the estimated useful life of the property through uniform monthly charges, referred to herein as "straight-line" charges. This method has not so far been applied to minor property elements, but itemized accounts are required for major elements or groups of similar elements, and appropriate charges to a special operating expense account are prescribed to accumulate a reserve equal at all times to the loss in service value or accrued depreciation in the property.

The state systems do not provide such a depreciation reserve at all. In fact, the word "depreciation" does not appear anywhere in these classifications. A substitute "retirement reserve" is

provided, intended to equalize the cost of writing off property elements when they cease to be useful. This reserve may be accumulated through charges to operating expense or appropriations from surplus, or both, and the charges or appropriations need not be uniform.

Criticisms of Accounting Methods

The principal objections made to the interstate depreciation accounting methods are that property is not, in fact, uniformly consumed in service but may be retired for causes not subject to forecast and wholly unrelated to actual operation. It is pointed out that a comparatively small part of utility property wears out in service, the major retirements being occasioned by obsolescence, inadequacy, and changes in public requirements or demands as expressed in city ordinances or otherwise. It is also contended that, because of this high proportion of retirements for other than physical reasons, it is impossible to foresee the useful life of property elements with any approach to accuracy, and, further, that an estimate of salvage value made many years in advance of realization may be very far from correct.

These criticisms of useful life estimates are abundantly sustained by actual experience with public utility property. Careful analyses of typical railway properties covering long periods of years have shown that substantially more than 75% of the total retirement costs were due to functional rather than physical causes. Further substantiation is found in the report of a committee of the national association of electric railways appointed to study the subject, which held that any efforts towards standardized figures of useful life would be not only futile but mis-

leading. These recommendations were made in the light of extensive experience and data applicable to actual useful-life history, but with the view that varying conditions and unforeseen developments to which utilities are subject might make future experience radically different from recorded history. Other classes of utility property are subject to similar, although perhaps not equally active, influences.

The principal objections to the state systems are that investors are not fully protected against loss in value of the property which they own unless reserves more extensive than those contemplated are provided, that their customers may not currently pay for the full cost of their service because of inadequate provision for deterioration of property in service, and that flexibility in the rate and extent of retirement accumulations, although sometimes desirable, is subject to grave abuse and cannot readily be controlled by regulatory authorities.

None of the objections to the two accounting systems above mentioned should be lightly dismissed. If useful life cannot be estimated with any approach to accuracy, any intricate and uniform accounting procedure which assumes such accuracy is obviously futile and is inconsistent with those accounting principles which require that facts and estimates shall not be mixed unnecessarily. If, on the other hand, flexibility in retirement provisions is subject to abuse but this system is otherwise desirable, such limitations as are necessary or appropriate should be devised for the protection of investors or the public.

Actual experience with the state system of retirement reserves is still insufficient to permit mature judgment as to its effectiveness, although it should

be stated that for many years systems substantially in accordance therewith have been in effect on many properties whose operations have been successful from every point of view. The interstate system has been in operation for electric railways for a considerable period of years, but with too limited application to permit helpful statistical analysis of the system as a whole. It has been in more complete operation for many years on telephone property, and any definite conclusions based on practical experience are, therefore, restricted to this class of utility service.

For a number of years there has been increasing objection in rate cases to the size of reserves accumulated by telephone properties, and various efforts have been made by regulatory commissions to curtail these reserves. Although specific prescribed limitations are so far rare on such properties, it is of interest to note a growing tendency on the part of regulatory commissions to fix for other classes of utility property certain maximum limits to accumulated reserves which are definitely inconsistent with the straight-line system. If such limitations are continued and sustained by the courts, the futility of a system of accumulation which must be abandoned when the accumulations reach a certain stage is obvious.

Various writers on the subject of depreciation have pointed out that under certain conditions a depreciation reserve might be accumulated and thereafter indefinitely maintained at approximately 50% of the investment in the property. It is apparent that a reserve of this magnitude could never be used for its intended purpose because actual accrued depreciation on growing properties, as disclosed by many detailed appraisals, rarely exceeds 15% or possibly 20%, and no very

large proportion of such depreciation could be offset by replacements of property elements in any one year. Any excess of accumulated reserves over useful amounts is not wasted because it can ordinarily be invested in the property and earn a return that, because of correspondingly diminished capital requirements from other sources, may lead to lower rates. It is clear, however, that rates for service which include an unnecessarily large provision for depreciation involve undue burdens unless or until the return on the invested reserve reverts to the customers and is equal to the return which they could secure from other investments of their own selection.

Discussions of public utility depreciation have frequently overlooked one distinctive characteristic of utility services, that is, their unlimited life. Utility service is an ever-increasing necessity in individual and industrial activities. It is unthinkable that such service should cease except in certain relatively unimportant situations. There is, therefore, no such problem of liquidation or amortization as occurs in industries where the life of patent rights, changes in styles, and other human vagaries and demands are important factors. The investor in an enterprise of unlimited usefulness and constantly increasing scope does not need the same degree of protection for his investment as in the case of transient or otherwise uncertain industries.

Another factor has frequently been overlooked or given insufficient attention in studies and analyses of the depreciation problem. This factor is the growth of the properties involved. It is by no means clear that the 50% unused reserve above referred to, although accumulated on a stable property, would also be developed on a

growing property. The author is not aware that any careful analyses have heretofore been made which have shown the effect of property growth on percentage accumulations. Because growth is the normal utility experience, its possible results should not be overlooked. This paper has, therefore, as its primary purpose an analysis of the effect of growth of utility properties on retirement and depreciation appropriations and reserves, measured in terms of present investment.

Retirement Costs

Ten years ago the author undertook certain similar analyses and demonstrated that retirement costs were widely varying percentages of present investment under different rates of growth, tending to decrease as growth became more rapid.¹ That study did not include in detail the subject of accumulated reserves since such accumulations obviously depend upon the method and amount of appropriations. Following the methods employed in the earlier analysis, the present paper will undertake to show the extent of accumulated reserves under certain assumed conditions. Where these reserves appear to be inconsistent with the limitations which regulatory commissions may impose, modifications will be suggested which will keep the reserves within prescribed limits.

A mathematical analysis such as is employed herein necessarily assumes a degree of uniformity which does not exist in any utility property. It is, therefore, pointed out that only general conclusions can be drawn, although, to the extent that the effect of departures

¹ "Depreciation Reserves as Affected by Property Growth," *American Economic Review*, March, 1916, p. 69.

from the assumed uniformity can be indicated, the conclusions become more dependable. The basic assumptions made herein are that utility property grows at a uniform annual rate and that its elements have a uniform useful life or a life uniformly distributed over a limited period of years. It will be shown that departures from uniformity affect retirement costs rather than straight-line depreciation appropriations.

In the formulas which follow, it will be necessary to use certain symbols, some of which for convenience are here assembled and defined:

- V , present investment in depreciable property
- v , investment in some prior year
- i , rate of annual growth of investment (a decimal)
- n , life of property elements (uniform or average)
- r , range of life of property elements
- R , current retirement costs
- D , depreciation annuity
- A , accumulated reserve

The formulas herein developed will be expressed as far as possible in such form that standard compound-interest or sinking-fund tables may be used in the solution. Such tables are to be found in various handbooks, such as Kent's *Mechanical Engineers' Pocketbook* and Montgomery's *Financial Handbook*. Where published tables are not sufficiently complete, they may be extended by slide-rule or logarithmic computations. The author's earlier paper, referred to above, contains tables with some such extensions.

For consistency with these tables it is assumed that the additions to public utility property made throughout a particular year are entered on the books at the end of the year and that depreciation appropriations applicable thereto begin in the following year. In addition

to the assumptions previously stated, some of the computations involve the further condition that the property studied has been in existence for an unlimited time, or at least long enough so that its elements have uniformly distributed ages with corresponding uniform annual retirements.

A simple formula for determining retirement costs in terms of present investment will first be shown. A property growing at the rate i has a relation between present value V and value v , n years ago:

$$v_n = \frac{V}{(1+i)^n} \quad (1)$$

The corresponding value $2n$ years ago would be:

$$v_{2n} = \frac{V}{(1+i)^{2n}}$$

and so on back to the time when the value is negligible.

The property retired in any year, assuming a uniform life of elements of n years, includes the items first installed n years ago, those which were new $2n$ years ago and renewed n years ago, those new $3n$ years ago and renewed for a second time n years ago, and so on. The value of these elements new or renewed in each of these prior years, representing the then growth of the property, is i times the entire investment in these years. The present retirement costs will, therefore, be the sum of the original costs of all these elements added to the property n years ago and multiples of n years ago. The total cost of these retirements, carried back to a period when the property had negligible value, is represented by the formula:

$$R = iV \left[\frac{1}{(1+i)^n} + \frac{1}{(1+i)^{2n}} + \frac{1}{(1+i)^{3n}} + \dots \right] \quad (2)$$

The major parenthesis in the above formula contains a series of terms having a constant relation. The general expression for the sum of such a series, in which the first member is a and the relation between the members is r , and the number of members is n , is:

$$S = a \left(\frac{r^n - 1}{r - 1} \right) \quad (3)$$

For our present purposes, with a less than unity and equal to r , and n equal to infinity, this formula simplifies to the form:

$$S = \frac{a}{1 - a} \quad (4)$$

The percentage of present value spent for replacements is formula 2, simplified as above indicated, divided by V , or:

$$\frac{R}{V} = i \left(\frac{\frac{1}{(1+i)^n}}{1 - \frac{1}{(1+i)^n}} \right) \quad (5)$$

The solution of this equation for various rates of growth (i) and lengths of useful life (n) is very simple within the range of published tables containing values of $\frac{1}{(1+i)^n}$. It will be found that the retirement percentage not only decreases with the increase in length of useful life but also decreases rapidly with increase in rate of growth of the property. These percentages are shown for certain conditions in Chart I.

If the useful life is not uniform but varies uniformly over a period of years (r), the average life still being n years, the formula of retirement costs is less simple than (5) above but is not difficult of solution. This formula contains r series of terms, each series of the form given above in formula 2 and each representing $\frac{1}{r}$ part of the

additions to the property in the various years. The first series is as follows:

$$\frac{i}{r} \left(\frac{1}{(1+i)^{n - \frac{r-1}{2}}} + \frac{1}{(1+i)^{2(n - \frac{r-1}{2})}} + \frac{1}{(1+i)^{3(n - \frac{r-1}{2})}} + \dots + 0 \right)$$

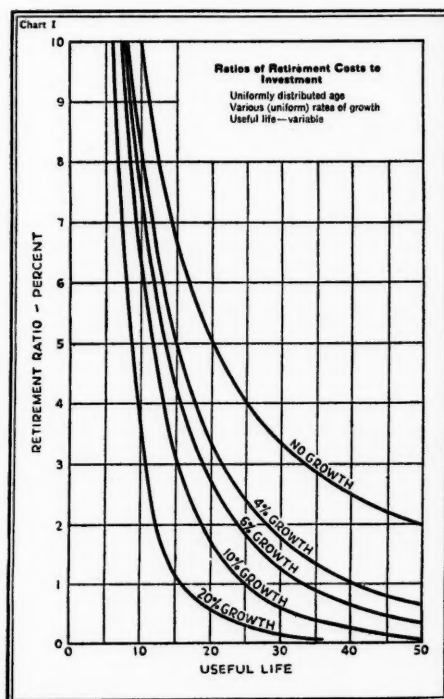
The second series is:

$$\frac{i}{r} \left(\frac{1}{(1+i)^{n - \frac{r-1}{2} + 1}} + \frac{1}{(1+i)^{2(n - \frac{r-1}{2} + 1)}} + \dots + 0 \right)$$

The final series is:

$$\frac{i}{r} \left(\frac{1}{(1+i)^{n + \frac{r-1}{2}}} + \frac{1}{(1+i)^{2(n + \frac{r-1}{2})}} + \dots + 0 \right)$$

The numerical value of the $(1+i)$ exponents in the above series may be



$$\frac{R}{V} = \frac{i}{r} \left[\frac{\frac{1}{(1+i)^n - \frac{r-1}{2}}}{1 - \frac{1}{(1+i)^n - \frac{r-1}{2}}} + \frac{\frac{1}{(1+i)^{n - \frac{r-1}{2} + 1}}}{1 - \frac{1}{(1+i)^{n - \frac{r-1}{2} + 1}}} + \frac{\frac{1}{(1+i)^{n - \frac{r-1}{2} + 2}}}{1 - \frac{1}{(1+i)^{n - \frac{r-1}{2} + 2}}} + \dots \right. \\ \left. \dots + \frac{\frac{1}{(1+i)^{n + \frac{r-1}{2} - 1}}}{1 - \frac{1}{(1+i)^{n + \frac{r-1}{2} - 1}}} + \frac{\frac{1}{(1+i)^{n + \frac{r-1}{2}}}}{1 - \frac{1}{(1+i)^{n + \frac{r-1}{2}}} \right] \quad (6)$$

illustrated by the case of a property in which the average life of elements (n) is 20 years and the range of life (r) is 15 years. The initial term exponents in the various series range from 13 to 27, inclusive.

Each of these series is of the infinite form and may be simplified as explained above (formula 4). The complete simplified formula for the percentage of retirement costs when the elements have an average life of n years but a range of life uniformly distributed over r years is as shown above.

Solutions for a considerable number of assumed cases indicate that within the usual range of life of property elements there is a comparatively small increase in retirement costs. If the assumptions were modified to provide for increasing cost of elements with increase in their useful life, in conformity with the general characteristics of utility property, this tendency to increased retirement costs would, in part at least, be offset. For purposes of further analysis the original assumption of uniform life of property, as well as uniform rate of growth, will, therefore, be employed.

Depreciation Annuities

The next step in the analysis is the determination of straight-line deprecia-

tion appropriations or annuities for different property characteristics. It is obvious that a mature and stable property without growth, and with a uniform life (n years) of all its elements,

would set aside $\frac{1}{n}$ times the stable value, V , each year. It may not be wholly obvious that this same annuity would be made by a growing property, but the following analysis is given to show that it still holds. For purposes of the analysis the property is divided, as in the case of the retirement cost investigation, into its new or renewed increment elements, keeping in mind the assumptions previously stated.

A property growing at the rate i and having a uniform useful life of elements of n years will make depreciation reserve appropriations for items originally installed n years ago and those involved in original or repeated renewals n years ago. The appropriation will be $\frac{1}{n}$ times the value of these elements. The formula for this appropriation is:

$$D_n = \frac{iV}{n} \left(\frac{1}{(1+i)^n} + \frac{1}{(1+i)^{2n}} + \frac{1}{(1+i)^{3n}} + \dots \right)$$

A similar formula applies to the appropriations for property elements installed or renewed in each of the

remainder of the n years of useful life, these formulas being illustrated below:

$$D_{n-1} = \frac{iV}{n} \left(\frac{1}{(1+i)^{n-1}} + \frac{1}{(1+i)^{2n-1}} + \frac{1}{(1+i)^{3n-1}} + \dots \right)$$

$$D_{n-(n-1)} = \frac{iV}{n} \left(\frac{1}{(1+i)^{n-(n-1)}} + \frac{1}{(1+i)^{2n-(n-1)}} + \dots \right)$$

The sum of these n series, each of infinite form, gives the required total of the current depreciation annuity in terms of present investment. Fortunately, this group of infinite series can be much simplified by removing from each of the series, after the first, a factor which leaves the balance identical with the first series. The sum of the n series is, therefore, the product of the first series, and another group of factors which is also in series form. Substituting the expressions for the sums of the respective series, and further simplifying, the final results are shown below to be equal to those for a property without growth:

$$D = \frac{iV}{n} \left(\frac{1}{(1+i)^n} + \frac{1}{(1+i)^{2n}} + \frac{1}{(1+i)^{3n}} + \dots \right) \left(1 + (1+i) + (1+i)^2 + \dots (1+i)^{n-1} \right) \quad (7)$$

$$= \frac{iV}{n} \left(\frac{\frac{1}{(1+i)^n}}{1 - \frac{1}{(1+i)^n}} \right) \left(\frac{(1+i)^n - 1}{(1+i) - 1} \right) \\ = \frac{V}{n} \quad (8)$$

If this method of analysis were carried further and applied to a growing property with a range of useful life instead of uniformity, there would be found, as in the case of the retirement

cost analysis, r times as many terms but all finally combining and simplifying to the same result. An annuity of $\frac{V}{n}$ in dollars and $\frac{1}{n}$ in percentage will, therefore, be used in subsequent analyses, all involving assumed uniformity.

Ratio of Retirements to Annuities

The next inquiry will be into the relation between retirement costs and straight-line depreciation annuities at any given time under certain assumed uniform rates of growth (i), and uniform useful life (n years). For simplicity these comparisons will be made directly between percentages. The percentage of retirement cost was given:

$$\frac{R}{V} = i \left(\frac{\frac{1}{(1+i)^n}}{1 - \frac{1}{(1+i)^n}} \right) \quad (5)$$

The formula for straight-line depreciation annuity under similar conditions before final simplification is:

$$\frac{D}{V} = \frac{i}{n} \left(\frac{\frac{1}{(1+i)^n}}{1 - \frac{1}{(1+i)^n}} \right) \left(1 + (1+i) + (1+i)^2 + \dots (1+i)^{n-1} \right) \quad (7)$$

The relation between retirement cost and depreciation annuity simplified is, therefore:

$$\frac{R}{D} = \frac{n}{1 + (1+i) + (1+i)^2 + \dots (1+i)^{n-1}} = \frac{n}{\frac{(1+i)^n - 1}{i}}$$

The above formula involves assumed factors or those directly obtainable from compound-interest tables, and so

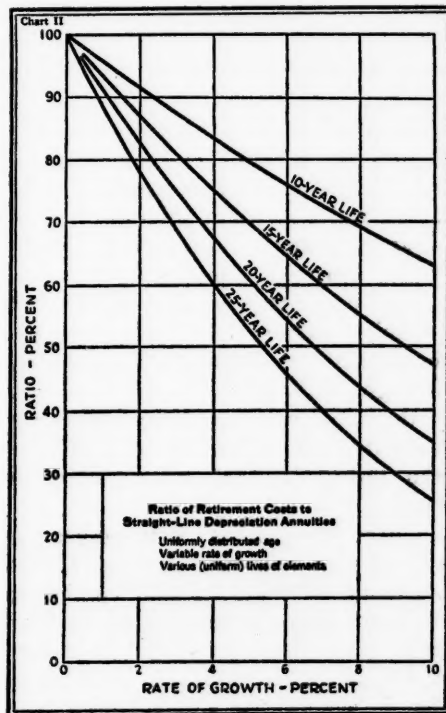
solution for a wide range of assumptions is readily made. Chart II shows the ratio of retirement costs to straight-line depreciation annuities for various years of useful life and a wide range of property growth. It appears that the ratio decreases as both rate of growth of the property and length of useful life increase. As typical illustrations, it appears that only 50% of the annuities are currently expended for retirements when the property is growing at the rate of about $6\frac{3}{4}\%$ annually, and its elements have a useful life of 20 years, or when the growth is about $5\frac{1}{3}\%$, with a useful life of 25 years, both of which conditions are within the range of utility experience at the present time.

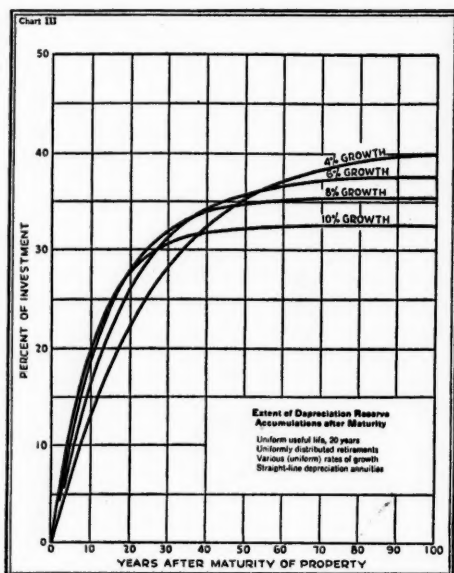
The significant fact to be noted here is that for a given useful life the depreciation annuities are constant, but that the retirement costs, although equal to the annuities for a non-growing property, steadily decrease with progressive rates of growth, leaving a constantly increasing balance of unexpended appropriations for accumulation in a depreciation reserve. So long as the assumed conditions continue, the reserve will also continue to grow in dollars without limit because the formula applies to *any* year in the history of a property after it has reached maturity. It does not follow, however, that the reserve will grow from year to year in percentage of the then value of the property.

Reserve Accumulations

The extent to which the percentage of accumulated reserve will continue to increase is logically the next field of inquiry. It will first be assumed that a mature property, having a uniform rate of growth (*i*) and uniform useful life

of elements (*n*), starts at the beginning of its period of maturity (when retirements have just reached stability and uniformity), without any accumulated reserves. In each year thereafter a certain percentage of the annual appropriations, as shown by formula 9, will be currently expended, and the balance will be retained for reserve accumulation. This balance being a uniform percentage under the assumed conditions, the application of this percentage to the value of the property from year to year during any assumed period will show the accumulation in the reserve, which may be compared with the value of the property at the end of the period. The following formula expresses this percentage accumulation for any year *p* years after the beginning of the period of maturity:





$$A_p = \frac{1}{n} \left(1 - \frac{n}{(1+i)^n - 1} \right) \left(\frac{(1+i)^p - 1}{i} \right) \frac{1}{(1+i)^p} \quad (10)$$

This formula is so arranged that all its factors are readily determined by the assumptions or from compound-interest tables, and a series of solutions is comparatively simple. The second factor in the formula represents the unexpended percentage balance of the first (annuity) factor; the third factor gives the sum of the values of the property throughout the years involved in terms of the initial value; and the final factor translates the percentage accumulation into terms of final value, which is sought.

Chart III shows percentages of accumulated reserves starting at the beginning of maturity and continuing for 100 years with various uniform rates of property growth. An examination of the curves in this figure shows that in general the accumulations tend

ultimately to stabilize between 30% and 40% of the investment, the reserves increasing quite rapidly during the first 20 or 30 years, the increase thereafter being comparatively slow until it finally practically disappears. The early growth of the reserve is most rapid with high rates of growth of the property, but the ultimate accumulation is smaller than that with lower rates of growth of the property, under which, however, the early accumulation is relatively slow.

During the early years of a newly established property retirement costs are comparatively small, negligible in the initial years, and gradually increasing as maturity is approached. It is the common experience of newly established utilities that their operations are unprofitable, continuing so for a considerable period of years. In practice during these early years it is often impossible to make appropriations to the extent required by the straight-line depreciation method out of the available income, and they are frequently curtailed until more prosperous years are reached.

For purposes of further study of reserve accumulations it will, however, be assumed that it is possible to make the full prescribed annual appropriations from the very beginning of operations, and by making suitable assumptions regarding retirement expenditures, the reserve accumulation during the period of immaturity may be computed. Some typical computations of this character have been made on the assumption that the retirement costs in the initial year are zero and that they increase with approximate uniformity until maturity is reached, after which time the unexpended balances of the depreciation annuities will continue as already determined. Such

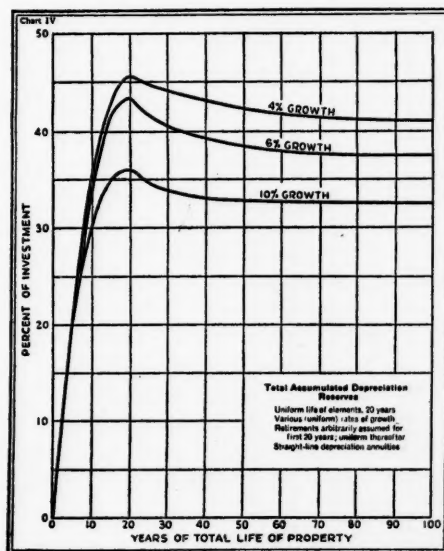
computations for the immature years cannot readily be made by formulas because of the arbitrarily assumed margins of accumulation.

Chart IV shows several cases in which properties grow uniformly at certain assumed rates throughout their history. The curves have a less symmetrical form than those previously considered, with very rapid increases in the reserve during the immature years, after which the percentage finally decreases to a point of practical uniformity. The decrease from the peak at maturity is due to continued increase in property value as compared with the abnormal reserve accumulation of the immature years. It will be noted that the ultimate reserve is not materially greater than that shown in Chart III, which ignored the accumulation in the immature years, for the reason that the fixed amount of reserve carried undisturbed from the immature period becomes a constantly decreasing percentage of present value as the property becomes older.

Reference is again made to the fact that no actual operating utility ever meets the assumptions upon which the foregoing computations are based. The author appreciates that he may be subject to criticism for questioning the possibility of accurate forecasts of useful life and then assuming a sustained uniformity of life in the foregoing computations, but such assumptions are necessary to the method adopted however much they may depart from actualities. Changes in useful life affect both retirement costs and depreciation annuities in varying degrees, but the ratio between the two is not radically affected by such permanent or temporary changes as have been common in past history. This is shown by the curves in Chart II.

There is, of course, lack of uniformity in property growth due to cyclical changes in business, although history shows that such changes have had smaller effect on normal public utility properties than on industrial enterprises. It will be seen from Charts III and IV that the results in accumulated reserves would not be largely affected by an occasional shift in rate of growth from 4% to 10%, or vice versa, within which range most progressive public utility properties will remain. The reserve accumulation in the immature years of most properties would probably be somewhat greater than that assumed and shown in Chart IV if uniform straight-line appropriations were consistently made from the beginning, but we have seen that ultimately it will make very little difference whether the initial accumulations are larger than assumed or whether they are wholly absent.

A wide range in useful life of elements and diversity in the value of these elements, such as always exist, and



which never approach uniformity, have an effect on retirement costs, and, therefore, on the accumulated reserve which cannot be measured by simple formulas. As already pointed out, the tendency of such departures from uniformity will normally be to neutralize each other, but the net result may be to increase somewhat the retirement costs and, therefore, to reduce the accumulated reserves. Detailed computations under arbitrarily assumed conditions would probably show a comparatively small final departure from the results shown herein, which are, in fact, confirmed in a general way by the experience of certain properties covering a considerable period of years.

Size of Useful Reserve

Assuming that a normal utility property would in time accumulate and maintain straight-line depreciation reserves amounting to 35% or 40% of the investment in the property, the question may well be asked whether it is reasonable and equitable for indefinitely continuing properties to take such sums from their customers for investment in property additions or elsewhere when one-quarter or one-third of such accumulation would be ample to provide indefinitely for actual retirement costs. As has already been stated, an increasing number of authorities are coming to the conclusion that a smaller percentage reserve is adequate for all practical purposes other than the risk of a rate base reduced below the investment by an amount greater than the restricted reserve. To the extent that the authorities who limit the reserve accumulation are identical with those who fix the rate base, and their rulings in the two cases are consistent and equitable, the risk of a confiscation of value

disappears. There remains the possibility of a finding of the appellate courts inconsistent with those referred to of the regulatory authorities. If or when it should become well recognized standard practice of regulatory commissions to limit reserve accumulations, this practice would doubtless have recognition by the courts. Until that time arrives, utilities may be justified in retaining in their reserves or their corporate surplus a greater margin than would otherwise be necessary for protection from confiscation.

As the author has pointed out elsewhere,² there may also be other circumstances under which more extensive reserves are permissible. If a company has a particularly favorable field of activity or class of business, involving costs less than those in other places or less than the value of service to patrons, it may without injustice maintain such rates as will permit more liberal reserves as a protection against unforeseen changes in the art, business reverses or calamities.

Some further reference to the word "investment" as used herein is desirable. In the preliminary definition of terms, *V* was described as referring to *depreciable* investment. It was also pointed out that the interstate accounting system, even if expanded as proposed, would cover only certain parts of railway property in service, the balance being optionally maintained by direct charges to operating expense. This distinction is in accordance with general practice with respect to the many minor items of property particularly subject to wear or decay, and which are recurrently renewed without distortion of operating costs. Large and more costly elements could not be

² *The Economics of Public Utilities*, McGraw-Hill Book Company, 1925.

so handled without distortion, and the reserve is utilized for their retirement. The extent to which the reserve is used may depend on the size of the property or its physical or financial condition. An element which is considered "large" for a small property may be such an insignificant part of a large property as to be replaced through the more direct and simple process of maintenance charges. The scope and size of reserves are thus subject to still other uncertainties than those previously outlined.

Varying interpretations of the term "investment" do not, however, affect the results of the analyses made herein, in which retirement costs are compared with depreciation annuities, for the same investment is used for both. To the extent that the accumulated reserve is compared with an investment in depreciable property only, or in large units of such property, the percentages obtained will be greater than if applied to the entire investment. If, for example, one-third of the entire investment either was not subject to deterioration or was kept up through direct maintenance charges, the straight-line depreciation reserve would accumulate to something like 25% of the entire investment under conditions herein assumed. It is regretted that this discussion cannot be extended to include further reference to the intimate relation between retirements and current maintenance, and the advantage of considering them together in their relation to investment or, more advantageously in many cases, to current revenues.

One further inquiry may be of interest. Assuming that a reserve of 10% of the total investment is all that is needed or all that will be allowed by regulatory authorities, what appropriations under assumed uniform condi-

tions, such as are used herein, would be necessary to accumulate and maintain this reserve? The answer may be obtained in part by the use of formulas given previously. Taking first the case of a property growing at the rate of 6% and having a useful life of 20 years, simple computations show that if during the immature years of the property (assumed to be 20), seven-eighths of 1% is put into the reserve in addition to retirement expenditures, and thereafter two-thirds of the normal straight-line appropriations is made, the reserve will accumulate to and remain at slightly in excess of 10%. The same results will be obtained with a property growing at the rate of 8% and having the same useful life, if the margin of accumulation over actual retirement costs in the immature years is 1% and the appropriations thereafter are on the basis of 60% of the full straight-line requirements.

The 10% accumulation developed in the preceding paragraph was assumed primarily because it represents a limit fixed in certain cases by regulatory commissions rather than because it represents a suitable limit for public utility properties generally. Such properties vary widely in their characteristics, and their reserve accumulations may properly differ correspondingly. Furthermore, the requirements of a particular property may be different in successive stages of its history. In any case it is difficult accurately to establish a fixed percentage limitation to retirement accumulations. It is much easier to select a percentage that is a maximum beyond which under any conditions that can be foreseen the accumulation need not be carried. It is similarly easy to select a lower limit of accumulation below which the reserve could clearly not be drawn with safety to the property

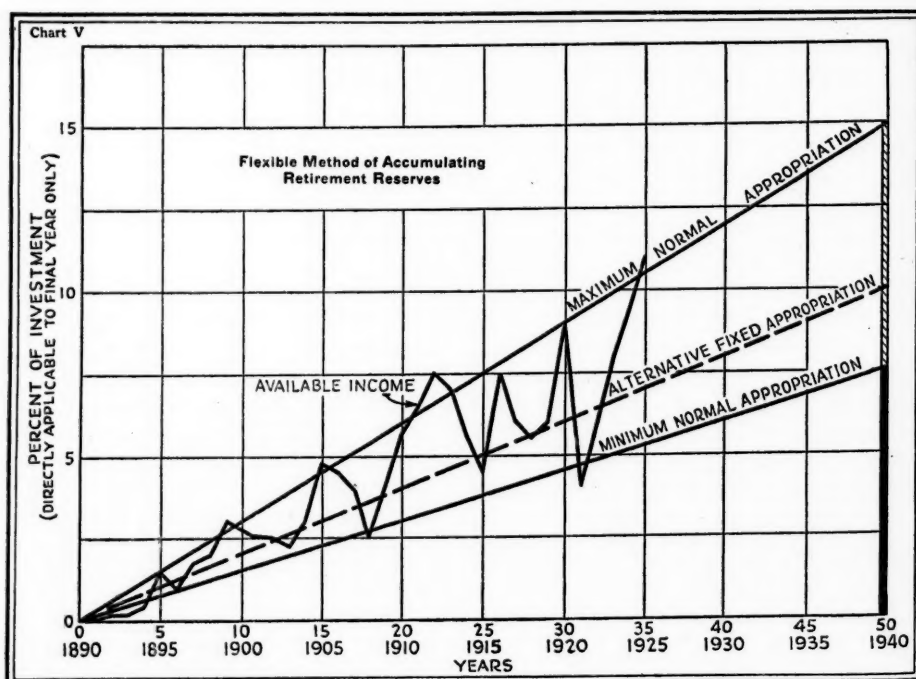
and the continuity of its service. The zone between such established upper and lower limits, therefore, represents a field within which the reserve may fluctuate with reasonable, although not uniform, safety.

Flexibility

If such flexibility in the accumulated reserve is both appropriate and safe, it follows that there may be a corresponding flexibility in the recurrent appropriations to the reserve. In periods of prosperity the appropriations might be such that they would tend to bring the reserve to its upper limit. In periods of depression the appropriations might, with equal propriety, be curtailed with the lower limit of the reserve as the temporary goal. Under conditions of unusual prosperity or depression there might be even wider

fluctuations in the appropriations, if in the long run the goal of accumulated reserve was aimed at with consistent fidelity.

This situation is roughly represented by a diagram (Chart V), which shows the net profits of a hypothetical utility after provision has been made for all expenses, taxes, interest charges, and suitable dividends. This utility decided that it should maintain a retirement reserve of not less than 7.5% and not more than 15% of its investment. Other than for a few years of exceptional depression, the balances available were sufficient to aim for the minimum accumulation, and in several years they were more than sufficient to aim at the maximum accumulation. The actual reserve which the company could have accumulated during its history would clearly be in excess of 10% of its investment.



If, instead of establishing a zone within which the reserve would be kept, it had been required to maintain consistently under all conditions a fixed reserve of 10%, it appears that in certain years dividends would have been curtailed, and interest charges might not have been fully earned in the early years. The resulting impairment of credit or receivership and consequent inability to finance extensions in keeping with community growth which would be involved in such a policy would be unfortunate both for the utility and the community served, and would have accomplished no useful purpose which the alternative flexible policy consistently followed does not accomplish.

Many important considerations involved in the permanent upkeep of utility property have been omitted from or barely mentioned in this paper. Their adequate treatment would unduly lengthen the discussion and divert attention from its central theme, which is by no means an academic one. Each of the two schools of thought referred to, promoting provisions for depreciation and retirement respectively, has many active and earnest supporters. The former has in the past dealt largely with widely distributed or movable property. The latter deals primarily with localized property with diverse climatic and other conditions. The former would extend the scope of depreciation charges to local as well as interstate properties. The latter sees danger in such extensions and also in the continued, consistent use of "straight-line" methods in present prescribed fields. This sharp difference of opinion is sufficiently acute and important to warrant independent and undistracted attention to all aspects of these problems.

Conclusions

The conclusions which may fairly be drawn from the foregoing discussion may be summarized as follows:

1. Actual experience with useful life of property elements in the past, which has been carefully recorded by some utilities, is not a dependable measure of such life in the future, in view of rapid changes in the art and the progressive technical developments affecting all types of utility service;

2. The useful life of utility property and its ultimate salvage value are matters of such grave indefiniteness as not to justify specific, uniform and detailed calculations of so-called depreciation or loss in value;

3. Utility customers are not concerned as to whether the payments which they make through rates for property upkeep are used to offset current loss in value of all property used in furnishing their service, or whether those same payments are applied to the final retirement of certain elements which they and others have used in the past;

4. A straight-line appropriation for depreciation consistently and correctly made over a long period of years will amass a reserve in a normal growing property amounting to 35% to 40% or more of the investment in the property;

5. The major part of this reserve can never be used for its intended purpose and, under appropriate regulation, is not needed for the protection of either investors or customers;

6. Some flexibility in the accumulated reserves and in the appropriations thereto are consistent with the fundamental uncertainties of the problem and are essential to maximum financial stability and usefulness of the utility;

7. A system of utility accounts

which provides for flexibility in provision for retirements should be encouraged, with the understanding that suitable safeguards are provided against abuse of such flexibility. Such safeguards may be embodied in a definite program under which utilities will undertake to accumulate reserves within

certain defined limits appropriate to the character of their property, and to maintain such reserves by annual or other appropriations made in the light of existing accumulations, current business conditions, the credit standing of the property, and otherwise in the interests of its users and owners.

SYMPOSIUM ON IOWA LAND VALUE APPRAISALS COMPARATIVE FARM-LAND VALUES IN IOWA

By HENRY A. WALLACE

APPRAISING farm land is an art, not a science. From a practical standpoint an art oftentimes gives better results than a science. If, however, we are to have any adequate comprehension of the forces at work, we must employ scientific methods.

Experienced land appraisers seem for the most part to disparage scientific procedure. It is true that on the whole their methods are eminently satisfactory to the insurance companies and mortgage companies which they serve, but they have not been able to formulate by these methods any very definite measurement of the elements in the making of comparative farm-land values.

An insurance company which loans extensively in the Corn Belt has the following score card¹ for determining these values:

- I. Agricultural Productivity..... 40%
 - A. Natural Fertility of the Soil 12%
 - 1. Determined by its color, depth, and growing crops.
 - B. Area in Crops.....12%
 - 1. How much not in crops could be put in? Cost to do so?
 - 2. What can non-tillable land be used for?
 - 3. Are fields irregularly shaped on account of draws?
 - C. Topography 6%

- 1. Should slope enough to drain well, but not enough to wash.
 - 2. Terraced? Condition of terrace?
- D. Drainage 6%
 - 1. Porous soil, no hard pan.
 - 2. Ditches: open, tile, outlet, condition.
 - 3. Overflow: Head water or back water.
 - 4. Levees and levee taxes.
- E. Adaptability to Type of Farming 4%
- II. History and Condition..... 20%
 - A. History10%
 - 1. How many tenants during the last fifteen years? Why?
 - 2. Has farm been a trading proposition?
 - B. Condition10%
 - 1. Good state of tilth or run down?
 - 2. Rotation practiced? Organic matter returned?
 - 3. Commercial fertilizer used? Why?
 - 4. Is there a good garden and orchard?
- III. Community Value 25%
 - A. Neighbors 6%
 - 1. Progressive? Good farms and farmers?
 - B. Roads 8%
 - 1. Kind and condition.
 - 2. Main highway or neighborhood road?
 - C. Markets 5%
 - 1. Distance from farm to market?
 - 2. Size of market-town industries, banks, railroads, and so forth.

¹ Babcock, F. M., *The Appraisal of Real Estate*, Macmillan, 1924, pp. 226-227.

TABLE I. IOWA LAND VALUES BY COUNTIES AND FACTORS BEARING ON LAND VALUES

Name of County	A Corn Yield per Acre, 1914-1923	B Percentage of Land in Corn, 1925 Census	C Percentage of Land in Small Grain, 1925 Census	D Percentage of Land Not Flowable, 1925 Census	X Land Value per Acre (without buildings) 1925 Federal Census	Y Land Value per Acre (without buildings) 1925 State Census	Predicted X*
Adair.....	36	32	16	19	\$ 93	\$ 88	\$103
Adams.....	33	30	14	14	90	89	92
Allamakee.....	42	13	15	44	66	49	74
Appanoose.....	35	19	10	28	68	60	68
Audubon.....	40	34	21	9	115	111	130
Benton.....	42	35	22	17	143	125	134
Black Hawk.....	38	32	25	17	132	114	117
Boone.....	41	40	25	18	151	141	141
Bremer.....	39	27	24	28	93	79	104
Buchanan.....	36	32	20	24	95	81	103
Buena Vista.....	43	40	28	12	153	139	153
Butler.....	35	32	24	20	118	98	104
Calhoun.....	44	41	33	9	173	161	163
Carroll.....	43	38	24	11	154	141	148
Cass.....	37	34	24	9	115	106	121
Cedar.....	45	32	18	15	133	119	138
Cerro Gordo.....	38	35	25	19	126	117	121
Cherokee.....	43	39	24	19	140	120	145
Chickasaw.....	32	27	24	26	83	85	82
Clark.....	34	24	13	28	78	80	75
Clay.....	40	38	29	11	117	114	140
Clayton.....	43	18	18	35	85	74	94
Clinton.....	42	31	20	15	112	99	127
Crawford.....	40	35	21	12	121	104	130
Dallas.....	43	39	23	19	147	135	144
Davis.....	35	18	11	28	72	54	66
Decatur.....	32	24	13	27	66	67	69
Delaware.....	36	28	19	27	103	91	93
Des Moines.....	43	27	23	32	108	93	115
Dickinson.....	36	36	29	9	120	93	124
Dubuque.....	39	20	16	31	117	78	85
Emmett.....	36	37	29	11	116	114	125
Fayette.....	38	32	12	28	90	76	102
Floyd.....	34	34	27	18	105	94	108
Franklin.....	39	37	26	17	124	103	130
Fremont.....	39	48	16	12	132	123	147
Greene.....	43	43	26	14	158	149	156
Grundy.....	41	35	28	17	157	138	134
Guthrie.....	38	33	20	20	109	95	114

* On basis of regression line based on A, B, C, and D, as independent variables.

TABLE I (Continued). IOWA LAND VALUES BY COUNTIES AND FACTORS BEARING ON LAND VALUES

Name of County	A Corn Yield per Acre, 1914-1923	B Percentage of Land in Corn, 1925 Census	C Percentage of Land in Small Grain, 1925 Census	D Percentage of Land Not Plowable, 1925 Census	X Land Value per Acre (without buildings) 1925 Federal Census	Y Land Value per Acre (without buildings) 1925 State Census	Predicted X*
Hamilton.....	41	40	29	12	\$163	\$138	\$147
Hancock.....	36	36	31	12	127	122	124
Hardin.....	41	38	25	13	140	126	140
Harrison.....	38	41	22	17	116	97	131
Henry.....	41	30	17	32	113	87	110
Howard.....	30	23	23	25	75	68	67
Humboldt.....	42	40	31	9	147	137	153
Ida.....	42	39	25	10	141	130	147
Iowa.....	40	29	17	18	119	109	113
Jackson.....	44	19	13	35	75	68	96
Jasper.....	42	34	19	19	132	120	129
Jefferson.....	38	26	16	24	100	103	96
Johnson.....	44	29	17	18	118	108	126
Jones.....	42	25	14	19	116	97	110
Keokuk.....	41	29	18	23	116	87	114
Kossuth.....	38	37	30	9	128	113	134
Lee.....	38	21	17	37	88	78	80
Linn.....	41	30	19	22	131	110	117
Louisa.....	42	30	25	22	87	102	124
Lucas.....	35	22	13	26	79	70	76
Lyon.....	40	40	30	13	139	132	143
Madison.....	38	29	14	29	107	101	98
Mahaska.....	42	36	16	27	128	111	126
Marion.....	40	29	18	23	102	88	110
Marshall.....	45	36	21	15	148	141	147
Mills.....	38	43	18	14	137	112	134
Mitchell.....	36	29	29	15	99	85	108
Monona.....	37	40	23	19	111	101	125
Monroe.....	35	20	11	38	70	59	64
Montgomery.....	37	37	18	11	147	123	122
Muscatine.....	42	31	22	20	116	118	125
O'Brien.....	42	39	28	13	141	112	147
Osceola.....	38	38	32	12	125	117	135
Page.....	36	38	17	12	139	127	119
Palo Alto.....	38	38	30	11	134	120	134
Plymouth.....	39	39	25	11	142	126	136
Pocahontas.....	41	41	32	8	161	141	153
Polk.....	43	36	24	16	172	139	141
Pottawattamie.....	38	43	18	12	141	120	135
Poweshiek.....	42	34	17	17	129	119	129

* On basis of regression line based on A, B, C, and D, as independent variables.

TABLE I (Continued). IOWA LAND VALUES BY COUNTIES AND FACTORS BEARING ON LAND VALUES

Name of County	A Corn Yield per Acre, 1914-1923	B Percentage of Land in Corn, 1925 Census	C Percentage of Land in Small Grain, 1925 Census	D Percentage of Land Not Plowable, 1925 Census	X Land Value per Acre (without buildings) 1925 Federal Census	Y Land Value per Acre (without buildings) 1925 State Census	Predicted X*
Ringgold.....	33	27	12	14	\$ 77	\$ 85	\$ 85
Sac.....	44	38	27	15	158	153	150
Scott.....	46	30	24	14	150	129	142
Shelby.....	40	38	23	10	139	123	137
Sioux.....	44	41	28	12	149	143	158
Story.....	43	43	26	12	155	134	157
Tama.....	42	30	21	17	138	126	124
Taylor.....	35	32	15	17	90	92	101
Union.....	34	27	13	22	84	81	84
Van Buren.....	37	21	13	32	79	71	77
Wapello.....	36	24	17	31	97	89	82
Warren.....	38	27	18	23	96	91	100
Washington.....	40	30	19	20	124	113	115
Wayne.....	34	26	12	14	79	75	86
Webster.....	42	38	32	14	155	140	147
Winnebago.....	37	32	29	16	118	93	116
Winneshiek.....	38	22	21	29	84	71	89
Woodbury.....	36	43	22	12	121	106	131
Worth.....	35	28	29	19	97	94	101
Wright.....	39	40	30	12	147	129	141
Means.....	39.08	32.53	21.52	18.81	\$118.32	\$106.03	\$118.23
Standard deviations...	3.40	7.03	5.95	7.75	27.05	24.54	

* On basis of regression line based on A, B, C, and D, as independent variables.

D. School and Church..... 4%

1. Distance from?
2. Consolidated school and high school?

E. Health of Neighborhood.... 2%

IV. Improvements 15%

A. House 5%

1. Size, foundation, roof, flues, cellar, convenience, condition.

B. Barn 5%

1. Size, frame, foundation, roof, granary, hay fork, number of stalls, condition.

C. Other buildings 3%

1. Machine shed, hog house, poultry house, and so on.

D. Fences 2%

1. Kind and condition of fences and gates.

It is obvious that there is much more opportunity for the use of judgment than there is for the use of science in the application of a score card of this kind. If the appraisers are men of good judgment and if the men in the central office who supervise them are

acquainted with their various personal peculiarities, it is obvious that excellent results can be obtained with a score card of this sort. Moreover, as long as insurance companies safeguard themselves by loaning only 50% of the value of the land, they can make rather bad mistakes in appraisal without much risk.

Is it possible to work out a scientific foundation for appraising farm-land values in a state like Iowa? The methods which are set forth herewith are not expected to be of great immediate help to land appraisers in Iowa, but it is hoped that they will contribute something toward determining what factors make the farm land in one section of Iowa worth more or less than the farm land in another section. The facts on which the study is based are figures for the different counties of corn yield (A),² percentage of land in corn (B), the percentage of land in small grain (C), the percentage of land which cannot be plowed (D), and the value of the land per acre without buildings as estimated both by the Federal census (X) as of January 1, 1925, and the Iowa state census (Y) as of the same date. These figures for the different counties of Iowa are presented in Table I.

The method of multiple correlation is eminently adapted to a problem of this sort. The simple correlations between the different factors are given in Table II:

TABLE II. SIMPLE CORRELATION COEFFICIENTS

Federal land value (no buildings) and	
1. 10-year average corn yield per acre.....	.6293
2. Percentage of land in corn.....	.8082
3. Percentage of land in small grain.....	.6375
4. Percentage of land not plowable.....	-.6895
Ten-year average acre yield and	
1. Percentage of land in corn.....	.3040
2. Percentage of land in small grain.....	.2755
3. Percentage of land not plowable.....	-.1619
Percentage of land in corn and	
1. Percentage of land in small grain.....	.6187
2. Percentage of land not plowable.....	.8135
Percentage of land in small grain and	
1. Percentage of land not plowable.....	-.6015

Using Federal land values per acre as the dependent variable and the other four factors as independent variables, we find that the multiple correlation coefficient is .9166. The multiple regression line is predicted X equals $3.4A$ plus $1.8B$ plus $.6D$ minus $.6E$ minus \$74.72.

Apply this formula to Adair county, for instance, where the 10-year average acre yield of corn is 36 bushels, the percentage of land in corn is 32, the percentage of land in small grain is 16, and the percentage of land not plowable is 19. Thirty-six times 3.4 gives \$122.40 an acre credit because of the 10-year average acre yield of corn; 1.8 times 32 gives \$57.60 an acre credit; 16 times .6 gives \$9.60 an acre credit; 19 times minus .6 gives minus \$11.40; these figures added together with the constant factor of minus \$74.72 give a net of \$103.48, as the predicted value of farm land in Adair County on the basis of the four independent variables. The actual value is \$93, or there is a difference of \$10 an acre.

The application of this formula to each of the 99 counties in Iowa is given in the last column of Table I. It will be noted that the formula seems to be from \$20 to \$30 an acre below value in the case of Polk, Montgomery, Page, Dubuque, and Grundy counties. Has the Federal census made a mistake in these counties or are there special considerations for which the formula does not make allowances? In the case of Polk County there is a city of 150,000 to be taken into account which may cause farm land in that county to be valued somewhat higher than the strictly productive factors would indicate. On the other hand, corroborative evidence from the state census would

² See Table I.

indicate that perhaps the Federal census takers might have overvalued the Polk county land. The same reasoning seems to hold for Dubuque where the answer given by our formula checks much more accurately with the state census values than with the Federal census. In the case of Grundy, Montgomery, and Page counties, there are a number of wealthy foreign-born farmers who came through the land boom without making as many serious mistakes as were made in other sections of the state.

The writer does not care to defend this formula as the last word in scientific accuracy. It is his belief, however, that land appraisers in Iowa who are willing to accept the Federal census values as of 1925 will find the formula of some use. In applying it, however, they should keep in mind just how this formula was derived and make their own corrections, so as to fit most accurately the specific time and place. For example, a certain farm may put about 40% of its land into corn one year with another and get an average acre yield over a period of years of approximately 40 bushels. About 20% of the land is put into small grain, and 20% cannot be plowed. The farm is level and well drained and has a black Webster silt loam characteristic of the richest land of north central Iowa. The farm is near a good road, two miles from market, and the taxes are only \$1.50 an acre. Aside from the land which cannot be plowed, none of the fields are broken up with ditches. The buildings are worth \$50 an acre. Using our formula and common sense, what should this land be worth on the basis of 1925 census values?

Applying the formula by itself we find that the land alone has a value of about \$133 on the basis of the 1925

census. Adding \$50 worth of buildings per acre, we get \$183. Because the soil is black, level, well-drained, and arranged in fields which are not broken up by draws, we add another \$20 an acre and get a value of \$203. Because the farm is located closer to a good market than the average farm, and because it is better situated with respect to roads, we add another \$15 and get \$218. Because the taxes are more moderate than is usually the case with a farm of this quality, we add another \$5 an acre and get \$233.

Of course, there are other things to be considered with which the skilful appraiser is thoroughly familiar, such as the general character of the neighborhood and a multitude of considerations which are brought out in the insurance company's score card published in the early part of this article.

The value of the buildings per acre is a rather hard thing to arrive at. The census figures indicate that in 1925 the buildings on most Iowa farms were worth fully as much, if not more, than in January, 1920. Land without buildings had gone down until it was worth only a little over half as much, but the buildings were still priced at peak levels. This is doubtless because it still costs nearly twice as much as it did before the war to buy building materials. Occasionally a farm is overimproved so that it is necessary in appraising it to add, because of the buildings, a value less than their replacement costs less depreciation. The experienced farm-land appraiser is not likely to make any mistake on this score.

The one factor above all else in determining comparative land values in Iowa is productive power in terms of corn. If we multiply the percentage of land in corn by the 10-year average acre yield of corn, and get the average pro-

duction in bushels of corn per hundred acres, we get a figure which is exceedingly significant with respect to Iowa land values. The most valuable land in Iowa is located in those counties where as a 10-year average 100 acres of farm land produce 1,600 bushels or more of corn. Using corn productivity alone as our independent variable for measuring comparative values of Iowa farm land, on the basis of 1925 census figures, we get the following formula:

Predicted value of farm land per acre without buildings equals .075 times the average productive power of 100 acres of the farm land in bushels of corn plus \$22. In other words, if a given farm produces an average of 1,600 bushels of corn per hundred acres, it should be worth about \$142. On the other hand, if it produces only about 1,000 bushels of corn per hundred acres, it is worth only about \$97 an acre. In other words, each extra bushel of productivity in terms of corn increases the value of the land per acre about \$7.50. This one factor of productivity of land in terms of corn obtained by multiplying the *A* and *B* factors in our table together, correlates with land values or the *X* factor in our table .897. This contrasts with our multiple correlation of .917 where we used four independent variables. There was some gain in introducing the factor of percentage of land in small grain and percentage of unplowable land. The all-important factor, however, is long-time productivity in terms of corn.

Although the writer has not had very close contact with the appraisal methods of insurance companies, he is of the opinion that in so far as they are valuing Corn-Belt land they do not make a sufficiently definite effort to determine the probable long-time productive power of a given piece of land in terms of bush-

els of corn. They seem to find it difficult to make a definite estimate as to the average acre yield of corn one year with another. Also, they seem to find it difficult to estimate about what percentage of the land can be put into corn one year with another and still maintain this yield. Insurance companies loaning in the Corn Belt have devised score cards for appraisal which are quite well adapted to eastern or southern farms but are not definitely fitted to Corn-Belt farming. Under the methods in use it would seem that insurance companies, unless safeguarded by the excellent judgment of their appraisers, tend to loan too high on poor land, whereas they fail to recognize how good the best Corn-Belt land really is. There are many farms in north central Iowa which are easily worth three times as much as other farms in southern or northeastern Iowa. While the insurance companies may have learned better by this time, there seems to have been a tendency in the past to be more willing to loan \$50 an acre on a southern Iowa farm than \$120 an acre on a good north central Iowa farm, though the higher loan on the north central Iowa farm was actually safer than the other.

Formulas, such as suggested here, will obviously apply only to sections where the type of farming is fairly uniform. It would be foolish to expect a formula of this sort to work very satisfactorily in Wisconsin. It might work fairly well in the Corn Belt of Illinois, although it would be better to work out a separate formula for Illinois, based on Illinois data. It would not work so well in Indiana because of the fact that the high corn yields in that state are attributable in part to purchased commercial fertilizers rather than to land.

The formula as set forth here is, of course, based on 1925 census values. If

farm-product prices improve and it is obvious that the general price level for farm land has increased, the formula can still be used, but a certain percentage should be added to it to take this into account.

It is believed that farm land appraisal in Iowa can to some extent be made into a science as well as an art.

It is believed that by introducing a certain amount of scientific method in addition to the methods already in use, it should be possible for insurance companies, Federal Land banks, and so forth, to place their loans more intelligently, not only from the standpoint of their policyholders, but also from the standpoint of their farmer borrowers.

THE APPRAISAL OF IOWA FARM-LAND VALUES BY AN INSURANCE COMPANY

By GRIFF JOHNSON

AFTER more than 20 consecutive years of experience in making first-mortgage loans on Iowa farms, I do not know a formula or fixed rule for comparative land values that would be practical in every-day work. Score cards are of no practical value in farm appraising. In arriving at land values we have to consider not only the capacity of the farmer to make nature yield good crops but also the efficiency of the farmer in his relations with other men, which determine in large measure what income the crops will bring. Other elements may be involved, as will be shown presently, but the two main types of considerations (affecting the capacity and efficiency of farmers) cannot be weighted by any hard-and-fast formula. Appraising land values is, after all, a matter of judgment backed up by experience. Especially when the purpose of the valuation is to estimate the security for a loan, we have to consider the personal factors which determine whether a given borrower will make full and regular payments. These factors cannot be put into the strait-jacket of mathematical formulas.

For lack of a formula, the explanation of existing appraisal practices must

be in terms only of elements to be judged, without attaching mathematical weights to each element. These factors are the outcome of actual experiences of these many years, which have taught many lessons on virtually every angle of the loan business and have brought reasonably successful results. It would not be fair, however, not to mention the five other members of our investment board who so ably aid me in this work by their friendly support and worthy counsel.

At the outset, it should be said that some of the members of our investment board were born and reared on Iowa farms and have been, and are, real-estate owners. These years of close-up contact with farming and the farm-loan problem, in their different aspects, coupled with frequent inspection trips to various quarters of the state, have given a ready-at-hand and priceless fund of information in regard to the history of farms and farm products when the question of values is to be determined over the committee table.

Moreover, our strong faith in the unfailing productive qualities of Iowa climate and soil in general has been corroborated by an unbroken succession of

bountiful crops. This continually adds to our belief that the maximum values of these lands have scarcely been approached. We also realize that, while every year marks failures in other lines of business and while some men fail in farming, a well-managed Iowa farm has not yet failed to support at least one family and yield some surplus as an annual dividend; also, that Iowa agriculture has never repudiated its debts or obligations, and the basket of charity has never been passed for the state.

Furthermore, some of the members of our investment board have seen Iowa lands pass through the transformation periods from government native prairies at \$1.25 an acre to the highly improved farm homesteads bought and sold by neighbor to neighbor at \$300 an acre and more. They have also seen these soils produce greater and more diversified crops under the greater skill of development and more intensified cultivation from year to year. The result is that we firmly believe Iowa agriculture is still youthful and that future years will show these farms producing more valuable crops than the most optimistic imagination can now picture.

As to present and near future values of farms of different character in divers localities of the state, there are many specific items which we take into consideration and keep under careful advisement. In the first place, although the lands of the state are rather uniform, in comparison with some other states, the soil has a number of pronounced variations in both quality and character. Hence, only by our personal field experience with additional aid and information from soil maps and the kind of crops produced to the best advantage are we able to arrive at a fair valuation

of such various farm types. In connection with the type of soil, we also keep in mind that the general scientific research by the United States Department of Agriculture and the experiments and advisory help of the State Agricultural College—which has no superior—on soil analysis and its best adaptability to certain grain-producing crops and grasses, are elements continually working for betterment and adding to the land value. These considerations point to the fact that virtually all Iowa tillable lands have a certain intrinsic crop-producing value. Hence, we can base our appraisal for loaning purposes according to the character, quality, and probable returns from an orderly marketing, in whatever form, over a term of years, say a 10-year average period.

In the second place, we consider the element of marketing practices. Our method takes into account whether certain feed crops, such as corn, oats, barley, rye, alfalfa, clover, and so forth, are sent to market hurriedly as soon as they can be gotten into form, irrespective of market prices, whether they are carefully stored on the farms under good housing and held till market prices seem at their highest point, or whether these food products are converted into other products which in turn are retained on the farms till favorable market prices can be commanded. Our theory is that the class of farmers who so diversify and manage their business that they can have the buyer seeking them instead of crowding their products upon the buyer, universally will have the best advantage. We observe that in some localities the farmers are awake to all the aids and advantages for betterment and get the resultant benefits, while in others they are idle and shiftless.

A third element of importance is the

incentive of ownership. Preference is given to localities where home-owned and home-occupied farms predominate over those occupied by tenants and owned by speculators or non-residents. It is practically out of the question for even an excellent farm with the most favorable surroundings to maintain properly the family of a landlord in "town style," the tenant family on the farm, bear the expenses of needed repairs, pay taxes and upkeep, and last but not least, care for a first-mortgage loan with prompt payments. A community of home-owned and home-occupied farms represents an element of land value which cannot be reckoned in dollars and cents. Such a district usually has a permanent, dependable, satisfied class of people. A farm in one of these high-grade localities is more valuable for our loan purposes than one of equally good soil in a slovenly community.

A fourth factor to be considered is the policy of diversification. While we hold steadfast to the principle that Iowa is the premier corn state, yet we realize there are other field crops and money-making by-products. Those farmers who follow a well-balanced, judicious production along general lines are much in advance of those who try to specialize, or seem satisfied with the time-worn routine of a field of corn, a limited acreage of oats, a small, over-taxed pasture, three or four light-grade cows, and a small crop of hog runts. Time has substantiated the conclusion that the better classes are gradually increasing and the rut-going, shiftless farmers are disappearing. Corn, hogs, and beef cattle are strong leaders, but not the only revenue producers, or tax and loan interest "paymasters."

By way of illustration, there are certain districts of the state where the

soil is adapted to blue-grass on a par with some Kentucky districts. These communities are gradually going over to dairy interests and poultry production. Many thrifty farm house-wives and children, caring for the dairy and poultry products, are gathering the half-dollars and dollars from day to day and week to week to the end that many of the family and farm obligations are paid by such funds while the husband, with his helpers, is making only an annual turnover of field and feed products. These dairy and poultry districts always have ready money because pay day comes once or twice a month from the creamery and shipping stations. Such people seldom object to semiannual tax and interest paying dates and are not often tardy or asking for extensions. But the majority of localities where the major crops, such as corn, cattle, and hogs, are relied upon are generally solicitous for pay dates only once a year.

Certain other sections of the state seem to have soil conditions congenial to heavy timothy growth, and the proceeds from seed bring an attractive remuneration. Another section of the state has received satisfactory profits, for a number of years, from cultivating and marketing crops of choice pop-corn. Still other sections have obtained good profits from beet-sugar crops, and have been and are adding yearly that crop to their general diversified list. Other similar items might be noted here, but these few convey the general idea. We know these better practices are gradually coming in to stay, and with them come firm determination and bright prospects for a greater degree of success. There may be some ups and downs in buying and selling prices before the beneficial supremacy is firmly established, but in the main such com-

munities handling their farms in this up-to-date diversified manner bring the values gradually to higher permanent planes.

A fifth element of value, of which our investment board is not unmindful, is the access to local markets and to the benefits of community life. This is largely a matter of adequate highways, and by "adequate" we mean both nearness and dependability, regardless of season. It adds to the productiveness of a farm and the value of land to have easy and quick access to local markets, to schools, churches, and community gatherings. Thus, close watch is taken and great interest is manifested in the state highway map, as it lies before us, to see what the improved roads have done and what will be the possible benefits from further work and development in this direction. This project is still in the embryonic stage. Much advantageous work has been done; more is in process of completion. Some communities are steadily accelerating the improvement and regard it well worth the price; others seem to be much disposed to retard it. It is of vital interest to discern whether public sentiment is for or against such betterments, and whether this sentiment is controlled by the probable cost, or fails entirely to see the undoubted enhancement in yearly benefits. Good roads are a wonderful asset to farms and farm values when constructed conservatively, judiciously, and in a business-like manner. We attach a favorable margin for this element where the roads are being built primarily for the farmers' business use, not for tourists' pleasure use.

Another element which is worthy of a specially prominent position in this account is the social, or community, element. By this we have in mind

certain districts where there are settlements, so-called, of certain nationalities. Some of these date back more than half a century. Nationality governed in some cases, religion in others, and perhaps a combination of both in other localities. The early leaders of such colonies seem to have been endowed with the good judgment and sagacity to select the best of our land. We have some such settlements spreading over goodly portions of three or four counties. These farmers seem to vie with one another in having the best cultivated lands, the best buildings and improvements, the best grades of stock, the best crops, the greatest number of bushels of corn to the acre, and many other items of neighborly competition. Their farms would always command the highest awards on loans and the most favorable going terms on sales. We have several such colonies composed of persons of German ancestry; others Scandinavian; others Hollanders; others Bohemians; some French; occasionally small neighborhoods of Hungarians. As to church affiliations, we have the Amanites, the Quakers, the Dunkars, and some others. All are excellent farm citizens. Their lands, improvements, thrift, close application to their industry are of the highest type. When setting down valuation figures for their properties, or their communities, a considerable percentage can be added by reason of this social factor. In this connection attention is always given to the fact that in these localities the parents are always watchful to get additional land in the neighborhood for their increasing families because among some of them there is a noticeable clannishness and they want all the children to settle on farms near to the parent nest.

So much for the general topic re-

garding comparative land values. When it comes to a necessity of close figuring on any one specific farm for the purpose of a loan, and the general evidence and information before us do not appear ample, we make a special further personal examination of that particular farm and all factors in its favor for the actual purposes under consideration at that time.

There is so much spoken and written these days regarding agricultural interests and so much speculative advice freely given that one rather hesitates to add to the volume thereof. Suffice it to say that our investment board endeavors to give close attention to the practical, businesslike methods which

are being pursued in the different sections of the state, realizing that there are different soils where different methods can best be called into service to get the best results, also realizing that there are various classes of farmers. No comparative valuations according to a formula can be made of lands in two counties on opposite sides of the state which would be of any practical benefit in appraising farms for conservative loan purposes. Through a continuous stretch of years the plan of close adherence to all these varied elements of value has brought very satisfactory results for our company in its extensive farm loaning business in Iowa.

THE PRINCIPLES INVOLVED IN FARM- LAND APPRAISAL PROCEDURE FOR LOAN PURPOSES

By ALBERT G. BLACK AND JOHN D. BLACK

THE first impression which one gets after studying the appraisal methods of the various agencies making loans upon farm land—the farm-mortgage companies, the insurance companies, and the land banks—is that appraising farm land is one art which has been pretty thoroughly mastered by all those practicing it. At least all the various agencies making loans on farm land seem to be following about the same practices. First, the borrower makes an application for a loan, an appraiser inspects the farm, fills out a report, and makes a valuation. The office may reject the application or modify the valuation. The reports turned in by the appraisers of the various loaning companies and agencies include almost identically the same headings: soil, climate, topography, drainage, land improvements,

area of land in different crops, buildings, roads, markets, community conditions, yields, farm income, assessed value, moral risk, recent sales in the territory. Whatever differences there are in methods must relate principally to different weighting given to these various factors. And it must be added in conclusion that the various agencies are in general well satisfied with their present methods.

It is the purpose of this article to raise serious question whether the practices now followed are so eminently satisfactory, to indicate some lines of attack upon the problem which should lead to considerable improvement, and incidentally to outline a few of the principles that are fundamental to good appraisal and loan procedure. The subject is an important one to borrowers as well as lenders.

Prevailing Loan Practices

To do this properly we must have details of the actual problems of appraisal more clearly in mind. A good way to get them in mind is to describe the common manner of handling these details. First is the matter of passing upon an application for a loan.

If the applicant is very heavily in debt, if interest or taxes are unpaid, or if the farm is poorly equipped, the company may reject the loan without appraisal. Most companies have well-defined loaning areas, and if the application offers land outside of these areas, the loan will also be refused. Within the approved areas, the company, if it has been in operation for some time, will probably have gathered a mass of data relating to soil, climate, and market conditions by counties and perhaps even by townships. Probably a limit has been set as to the amount of loan which will be allowed per quarter-section in each county. This figure has been arrived at largely through experience as to the size of loan which will "stand up" in particular areas. The company may likewise have collected sales figures for certain areas and, of course, will have appraisal records for other farms in many localities.

If the application for the loan is satisfactory, it is turned over to an appraiser. This appraiser has probably been valuing land in the vicinity for a number of years and, through experience, has learned about what land values are in any territory. He will go to the farm and get a general impression of the conditions of the farm, principally through the appearance of the buildings, fences, state of cultivation of the fields, and condition of live stock and equipment. He will walk over the farm and collect data from which he

can furnish the information required in his report. He will supplement his personal observations by inquiries of neighbors, business men, and the local banker with whom his company is probably in close cooperation. These sources furnish him with information as to the moral risk, sale values, and community conditions. His estimate of the income of the property will be based on his own observations of the yield of crops, and sales of live stock and live-stock products. Upon the basis of these data the appraiser will prepare his report, set a value for the farm, usually valuing land and buildings separately, and recommend a loan of an amount which he believes can be carried without risk to his company.

Recently a few farm-mortgage lenders, particularly life insurance companies, have gone somewhat further and have prepared score cards upon which the different factors affecting the value of the farm are listed. These factors are weighted according to their estimated influence upon the value of the land. The appraiser scores the farm on each of the points listed and adds the scores of the individual factors, thus obtaining a total score for the farm. Previously a basic value for a "perfect" farm within each area has been determined, and the value of the farm is calculated by multiplying the "basic value" by the percentage score of the particular farm.

Federal Farm Loan Procedure

The appraisal methods of the Federal Farm Loan System do not differ materially from those used by other leading agencies. Because of certain legal requirements there is more uniform handling of details by different banks than by private loaning compa-

nies, but the procedure of the appraisers is much the same. The Federal Farm Loan System also pays more attention to farm income as a factor influencing land values than do many of the other loaning organizations. The Farm Loan Act prescribes, in general terms, the method of arriving at the value of land and asserts that the "earning power of the land (for agricultural purposes) shall be a principal factor." The appraiser estimates the yields of the different crops grown, calculates the gross crop income on the basis of an estimated average price, and adds the estimated income from other sources. By taking 50% or 60% of the gross income, an approximate net income figure is obtained. The income calculated in this way, however, has little or no effect upon the value as reported by the appraiser. It serves only as a rough index of the amount available for the payment of interest and principal. The appraisers pay much more attention to the sale value of the farm or of other similar farms in the vicinity. They make an effort to verify the sale figures if the farm has been sold recently.

The appraisal methods actually in use can be briefly summed up as an estimate of present selling value largely by comparison with values set by recent sales in the neighborhood. Few appraisers can tell exactly how they arrive at the values they set on a farm, and if pressed closely will admit that in the last analysis their valuation is an "experienced guess" based upon their general knowledge of farm conditions, sale prices, productive capacity, moral risk, community value, and other similar factors. One farm-mortgage banker summarizes the present situation in appraisal practice by saying that an appraiser's "ability to value property is a combination of a keen sense of values

and credits, together with ability to gather pertinent information and know when he is getting true facts." The general attitude of farm-mortgage bankers regarding appraisal is that little improvement in current practices is possible or even desirable. If improvement were to be made, it would be along the line of selecting men with better judgment and collecting a little more information of the sort that is useful to the appraisers. Any attempt to reduce the extent to which personal judgment enters is fruitless because so many factors—as, for instance, moral risk—are so manifestly unmeasurable and exert such varying influences upon land values that they may be considered at all only by using personal judgment.

Four Parts of the Problem

The general problem involved may readily be separated into four parts as follows:

1. Assuming a given level of land values in an area at the time, what is the value of a particular farm at the time?
2. What will be the level of land values in the area some time in the future when it may be necessary to foreclose the mortgage?
3. What income will there be from the farm from which to meet interest payments and principal?
4. Is the borrower the sort of a person who will make an honest and effective effort to meet his interest and principal payments?

Obviously all four of these are important questions for any agency making loans upon farm lands. But strictly speaking only the first one of them is a problem of appraisal. Forecasting what land will be selling for 10 years hence is surely not "appraising" in the accepted designation of that term. Even more certainly are

forecasting land income and estimating moral hazard not appraising land. The answers to the second and third questions determine the percentage of the value that can be loaned, whether 40%, or 50%, or 60% of it; but they do not determine the appraised value. The answer to the fourth principally determines whether or not to grant the loan at all. The tendency of loan agencies to confuse questions, principally the first and the fourth, is one of the important reasons for the slow progress that is being made with the problem as a whole. Although this article is entitled "land appraisal," the authors are assuming that what the editors of the JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS really want is a discussion of the whole problem of determining the size and appropriateness of mortgage loans and are proceeding upon this basis.

The Appraisal Proper

Necessarily the part of the problem to which most attention needs to be given is that of estimating the value of a particular farm, assuming a certain level of land values prevailing in the area. This is best attacked in a large way, at first, by correlating county averages of land values with percentage of land improved, in pasture, in woodlot, and in different crops; also with crop yields, carrying capacity of pasture land, distance from the larger markets, value of buildings, and so forth. Census data can be used for this analysis. The method of analysis will, of course, have to be that of multiple correlation or else more highly involved cross-tabulation. The results will show the average effect on land values of an additional percentage of improved land, land in woodlot, land in wheat, and so

forth; of an additional bushel per acre in the yield of wheat, corn, and the like; of an additional animal unit carried on each hundred acres of pasture, and so on.

The area chosen for such an analysis ought to include 100 counties, if possible; but there should be no wide divergencies in physical conditions or cropping systems within the area. In marking out the areas, state lines can be completely ignored, unless it happens that state censuses supply valuable supplementary data.

The coefficients of correlation obtained in such analysis will run very high, some of them over $+0.95$; but part of this high correlation is spurious. Many factors besides the ones mentioned produce variations in the land values whose effects, however, do not reduce the coefficients of correlation as they should because they are averaged out within any county. Distance from local markets, for example, affects land values greatly; but the chances are that within any county will be found farms at all distances from local markets. This will also be true for the effect of type of road, size of the local village or city, size of farms, distance from main highway, and a number of the less significant factors.

The true correlations, if they were obtainable, would, however, be sufficiently high to warrant making use of the results in estimating the values of individual farms within the counties. But there will be some wide differences between the true values of many farms and those obtained from such a formula. Farms near local markets will be worth more than the formula will indicate, and those far from local markets will be worth less; likewise for the effect of type of road, and other factors. Guesses can be made as to the proper

allowance for each of these factors; but there is no reason why guessing should be resorted to more often with them than with the other factors. All that it is necessary to do is to assemble the proper data for the farms currently sold in the area and analyze these facts. This has been done for demonstration purposes for Blue Earth County, Minnesota.¹ Only those farms were included which had been sold during the four-year period 1916-1919, inclusive. The selling prices were checked against the records of the State Tax Commission. The following results were obtained:

For every increase of a dollar's worth of buildings per acre, land value increased \$1.07 per acre.

An increase of one point in the "land classification" index increased the land value \$0.73 per acre.

An increase of one point in the "soil productivity" index increased land value \$0.17 per acre.

Land upon improved state roads averaged \$21.92 more per acre than land upon dirt roads.

Land tributary to the larger towns averaged \$12.82 more per acre than land tributary to the smaller towns.

For a farm on a dirt road and adjoining a smaller town, each mile from town decreased land value \$3.42 per acre.

The land classification index was calculated on the basis of the amounts of land of different grades contained in the farm. The four grades used were: woods not potentially tillable, woods potentially tillable, wild hay land, tillable land. These grades were given a weight according to their estimated value significance. The soil productivity index was based upon the average yields of the principal crops grown in Blue Earth County.

The coefficient of multiple correlation was +.81. It would have been higher except for the difficulty of adjusting for the rapid rise in land prices during this period. The average sale price of all land sold in 1916 was \$114.52 per

acre; in 1917, \$124.46 per acre; in 1918, \$134.96; in 1919, \$157.23. In this case, it would have helped greatly to have averaged sale prices quarterly instead of annually. A checking of the formula value against the sales value for individual farms showed the following significant differences: (a) farms very near to town had sold for more than the formula price; (b) farms on a lake shore had sold for more than the formula price; (c) many tracts of land without buildings had sold for much less than the formula price. This was especially true if they were poorly located. It will be apparent that even these factors could be included in the formula as soon as enough sales records were obtained.

An interesting question in connection with such an attack on the problem is the method of handling buildings. One procedure is to let the appraisers estimate values of the buildings and let it go at that. There is always danger, however, that they will place them mostly too high or too low. By including estimated values of buildings in the analysis, a correction factor can be obtained for this, as was done in the Minnesota study. Or it may be that at any given time, buildings may generally add more or less to the value of a farm than their depreciated cost of reproduction. One would expect them to add more in a period of rapidly rising land prices, and the Minnesota study gave evidence of this. A third method is to include the physical facts as to the buildings, such as dimensions, type of construction, date of construction, and so forth, as variables in the multiple correlation analysis. This is the method which in the end will probably be used.

After such methods as the foregoing are developed, there will still be need for the judgment of the individual ap-

¹ Minnesota Technical Bulletin No. 9.

praiser. There will be special circumstances as to location, condition of the buildings and fences, nationality of the farmer, community organizations, and the like, which will need to be evaluated. But the field for "experienced guessing" will be very greatly reduced. It is significant that the probable error of the results in the Minnesota study was only 9.5% of the sales prices, as contrasted with 26.7% for the assessor's appraisals.

Since the Minnesota study was published in 1922, the Division of Land Economics and the Bureau of Public Roads of the United States Department of Agriculture have taken up this method of handling the problem. Six studies have been made, 3 in Iowa, 2 in Indiana, and 1 in Wisconsin. The results have not been published. Preliminary reports of the Indiana study of about 345 farms, furnished by Ernest Wiecking, of the Division of Land Economics, show farm value reduced from about \$215 per acre to about \$185 as the distance from market increased from less than 1 mile to 15 miles. As the yield of corn increases from about 31 bushels per acre to 70 bushels per acre, the farm value increases from about \$160 to about \$215 per acre. The effect of improved land on land value is quite marked up to 80%, but very little beyond this point. An increase in the value of buildings up to \$40 per acre increases farm value by an equal amount per acre, but very little beyond this point. The Iowa studies show correlation indexes varying from 0.75 to 0.79. The correlation index is the term applied to the coefficient of multiple curvilinear correlation. The significant factors used in these studies were distance to market town, road type, percentage of tillable land, yield of corn per acre, cost of

buildings per acre, and size of market town.

A valuable study in the methodology of determining the effects upon farm value of various factors is that of Mordecai Ezekiel.² Studies of this nature must be continued to furnish additional ground work upon which a truly scientific appraisal system may be based.

Income Not an Appraisal Item

Economists who have given no thought to the problem of appraisal of land are inclined to assume that appraisals should be based upon land income. There are three difficulties in the way of basing the appraisal of a farm upon annual net income. First, the current net income of a farm cannot be obtained with any sufficient degree of accuracy for the needs of appraisal because of the impossibility of finding a value for such items as the produce and supplies furnished the family by the farm, the family's use of the house and automobile, the farm operator's labor, the family labor used on the farm. It is true that all of these are valued in many farm surveys that have been made. But the methods used have been arbitrary and in many cases based upon bad economics. For example, valuing family labor at what it would cost to hire a substitute is bad economics. If farm-grown supplies are to be charged to farm families at what they will sell for *at the farm*, then the resulting net income must be capitalized at a rate that prevails *at the farm*. It must be remembered that, after all, nobody comes to grief if a wrong farm income is arrived at in a farm survey—it just assists in turning out another set

² *Factors Affecting Farmers' Earnings in Southeastern Pennsylvania*, United States Department of Agriculture, Bulletin 1400, p. 39.

of misleading survey figures. But here the case is different. Actual money is going to be loaned on the basis of the valuation made. It is the easiest thing in the world to vary the net income of a farm \$400 by estimating house rent, value of family labor, and farm-grown supplies on a different basis—and \$400 capitalized at 4%, which is a reasonable rate, equals \$10,000!

The second difficulty is that net incomes depend so much upon the management of the farm. Two farmers operating similar tracts side by side may easily differ \$1,000 in net income. One may plant more corn than the other, feed more steers or milk more cows; or he may have higher yields from all his crops, or average a hundred pounds more butterfat per cow. Incomes also may vary greatly from year to year. The method sometimes suggested of estimating an income such as would be made by an *average* farmer in an *average* year has something more to recommend it, but still leaves altogether too much to conjecture. One must not forget that a difference of only \$40 in an estimate of net income, assuming a 4% rate of capitalization, equals a \$1,000 difference in the appraisal.

The third and most important difficulty is that land values are not based on this year's incomes but instead upon anticipated incomes. The present valuation of land depends upon whether future incomes are anticipated to be higher or lower than present incomes. Only if all the future incomes of land are anticipated to be the same as the present incomes, can its values be determined by the simple process of dividing present income by the prevailing rate of return upon similar investments. There is no special merit in a valuation based upon such an anticipation. It is silly to say that such a valuation repre-

sents "true" value, or that it reflects true "earning power." It is much more reasonable, most of the time, and in most areas, to anticipate that future income and earning power will be higher than present incomes and earning power; and if so, present values will reflect this. The familiar formula showing this is as follows:

$$V = \frac{a}{r} + \frac{i}{r^2} \left(V = \frac{\$5.00}{.05} + \frac{\$.10}{.0025} \right) \\ = \$100 + \$40$$

The V = value of land; the a = amount net income; the r = prevailing rate of return upon similar investments; and the i = anticipated increase in annual net incomes.

If the annual net incomes were to rise to \$6 within a few years, and farmers should anticipate a still further increase, then the land might rise in value to \$200 per acre:

$$V = \frac{\$6.00}{.05} + \frac{\$.20}{.0025} = \$120 + \$80$$

Some have called the \$80 part of the \$200 "speculative," and assumed that the \$120 is based upon "true earning power." One is just as speculative as the other. Nobody knows what a will be any more than i . Both are true valuations. All valuations are based upon what people think or anticipate. They cannot be otherwise.

Land which is yielding an annual net income of \$5 and selling for \$140, is capitalized only at 3.59%. Land which is yielding an annual net income of \$6 and selling at \$200 is capitalized at only 3%. Assuming that net cash rent represents annual net income from farms, C. R. Chambers found land in the United States capitalized all the

way from 2.1% in Adams County, North Dakota, to 15.2% in Perry County, Arkansas. The commonest rates are around 5% in the north Atlantic states; about 4% in the north central states; around 8% in the southern states; and in the western states, around 5% in the non-irrigated areas.³

If income was to be used as a basis of land appraisal, by all means the safest procedure would be to estimate what the net cash rent of the farm would be, on the basis of prevailing rents in the area, and divide this by the ratio of cash rents to land values that prevails in the area. Mr. Chambers' study presents these ratios for 567 counties of the United States, and the ratios for intervening counties could be estimated with fair accuracy. The ratios have changed considerably since the 1920 census was taken. Some effort has been made by the Division of Land Economics to keep them up to date. Those interested should write Ernest Wiecking, of that Division.

The foremost authority on land appraisal in Europe, Professor Friederich Aereboe, of the Berlin Agricultural College (Hochschule), who has written a book on the subject of valuation of agricultural property, has made the following statement on the subject: "The so-called valuation according to revenue is impracticable, unscientific, and indefensible."⁴

Future Land Values

Agencies loaning money on land are no doubt in more real danger from shifts in the whole level of land values in a region than from mistakes in appraising individual farms. One of the

Federal Land banks has already suffered serious losses from such a cause. President Thompson of the Springfield Federal Land Bank once remarked: "I am not worrying about getting a proper appraisal of any one farm in New England. What I want to know is whether the present level of values in New England is justified, or whether some higher level or lower level is justified." The common method of meeting this difficulty is to keep a wide margin between appraisal value and loan. Some of the Federal Land banks met this issue when land values started booming in 1918 by placing a maximum on the amount loaned per acre—a prudent but still somewhat cowardly procedure.

It is unlikely that land values will be predicted with much certainty. There are too many unmeasurable factors involved whose influence exerts different effects on land values at different times. Land prices express the equilibrium of demand for the products from land and the supply of resources available for the production of those products, and in addition people's opinions as to the future increase or decrease in land income. The last is probably the most easily predicted of the three. The first two involve world-wide considerations of a sort beyond the scope of any reasonably accurate method of analysis. The analysis of demand for land products must include the proper consideration of standards of living in various countries, rate of growth of population, shifting of population, growth and decay of industrial centers, shifting of demand through substitution, and other similar questions. The analysis of supply of land resources must take into account the potential productive land of

³C. R. Chambers, *The Relation of Land Income to Land Value*. United States Department of Agriculture, Bulletin 1224, May, 1924, p. 6.

⁴Friederich Aereboe, "The Value of Land Property," *Bulletin International Institute of Agriculture*, Nos. 10-12, October-December, 1912, p. 2343.

the world, rate of utilization of this land, development of transportation lines which bring new areas into production, improvements in production methods, and other factors of like character. Another factor which affects the price of land is the control of credit and the monetary policy of the country. All these are factors which form the underlying basis of land values. In addition to these broad underlying factors are the multitudinous local factors affecting the trend of land values within small areas.

But despite the apparent impossibility of predicting land values with a high degree of accuracy, there are certain types of studies which help to determine the immediate trend. C. R. Chambers found that land values at a particular time reflect the degree of profitableness of farming during the years immediately preceding. Farmers tend to base their expectations upon the limited experience of a few years and capitalize these expectations into land values. If increases in income have been rapid, farmers project this increase into the future, thus forming the factor i in the land valuation formula. The period which forms the basis of these anticipations seems to be the preceding 7 to 10 years. Farmers base their valuations upon a limited experience and for this reason land values at any particular time may be considerably out of line, due to the very recent income history. At the beginning of this century farmers had been experiencing a period of low prices and meagre profits. Increases in income had been small. Farmers did not anticipate any great further increases in income. Consequently the ratio of cash rent to land value was high because the factor i exerted only a small influence upon values. The beginning of the century,

however, ushered in a period during which land income increased constantly and rapidly. These increases were recognized and formed the basis for anticipations of even larger income. Factor i became of increasing importance as a constituent of land values, and the ratio of cash rent to land value declined. The land values of the post-war boom were constituted to a large extent of the capitalized i , which became of more importance due to the projection into the future of the unusual profits of the war years. Farmers at the height of the boom forgot that their increases in income were consequences of the abnormal war-time conditions and began capitalizing them as they had been accustomed to do in the past. Mr. Chambers' study shows the extent to which i enters into land values at any particular time and also the direction and tendency of the trend of i .

Studies of these types assist loaning agencies to determine what percentage of appraised value it is safe to loan. Areas having a large proportion of land value based upon anticipated increase of income cannot support as large loans as can a territory having a larger ratio of cash income to land value.

Other trends may be studied with the object of determining if the anticipated increases in income are justified and whether they will be likely to be realized eventually in actual increases in income. Such phenomena as the growth and shifting of population, growth of industrial centers, trend of demand for farm products, trends in yields, all serve to indicate the likelihood of the continuance of the income and anticipated increase in income.

Future Incomes

Although it is unwise to attempt to

appraise a farm on the basis of its net income, nevertheless it is well to know what income can reasonably be expected from which interest and principal may be paid. Mr. Chambers' analysis shows the extent to which land values are composed of capitalized annual income and of capitalized anticipated increases in income. His results may also be interpreted as showing what proportion of the land value in an area is yielding no present income. Mr. Chambers found that the percentage of value composed of capitalized *i* varied in the areas studied from 42% to 62%. Certain areas had a still smaller percentage, but Mr. Chambers believes that these are too low for various reasons. It is obvious that an area having land values made up of 62% of capitalized anticipated increase in income receives a relatively smaller present income than does one having only 42%. Consequently a larger percentage of appraised value could be loaned in the latter case than in the former. The area having the 62% capitalized *i* had a value of \$128 per acre, but the annual income was only \$2.82 per acre. If 50% of the value were loaned at 5% interest, the interest charge would be \$3.20 per acre. If it is assumed that net cash rents are a satisfactory measure of income from land, only 44% of the land value could be loaned with assurance that the interest payments would be covered by the current land income. In the case of the area having 42% of its value composed of capitalized *i*, 67% of the appraised value could be loaned before interest charges equaled the present annual income. In other words, a 67% loan in some areas is of equal safety with a 44% loan in other areas, due solely to the difference in composition of land values in the two areas. This may ex-

plain why one mortgage company loaning 50% of the value of the land in one area failed, while another loaning the same percentage of value in a different area passed through the recent depression safely. All mortgage lenders should know the proportion of value due to *a* and to *i* in their territories in order to adopt a safe and just policy.

It is also worth while to estimate the net income for farms, assuming average production conditions and average farmers. While such data are not serviceable in determining appraised valuations, they are useful for estimating the amount of interest and principal payments which may reasonably be expected to be covered by net earnings. Probably a safety factor needs to be included to provide for the possible lower net income resulting from inefficient management in case of changes of ownership. Loaning companies should recognize that the income figures estimated in this fashion are not comparable with the net income of land as determined by investigations of the type made by Mr. Chambers. The latter include only land income, while the estimated incomes include land income and management income, as well as allowances for family labor, and the like.

The Moral Hazard

The determination of the moral risk of an applicant for a farm loan is not an appraisal item. The moral hazard does determine whether the loan is a desirable loan, but it has only a minor influence upon the value of the land offered as security. Land must also carry a value distinct from that attaching to the moral risk of the owner, for there is no certainty or even likelihood that the present owner will keep possession of the property for any consider-

able period. A farm may change hands half a dozen times during the term of one of the long-time mortgage loans. Its owners may alternate between men of good and poor moral risk; yet the value of the land will fluctuate little with each change of ownership. Moral risk, therefore, may be dismissed as a factor entering into land value. It must be taken account of, however, in loaning money, and the size of the loan allowed must be adjusted to the possibility of the farm passing to a poor moral risk.

Importance of Better Appraisal Methods

For the most part, loan agencies are content with present appraisal methods. From their points of view, current practices, at least until recently, have seemed quite satisfactory. During the post-war depression, however, some loan companies incurred heavy losses which should have been obviated with a better analysis of the structure of land values in the area and of probable or possible future land values. In the areas where few losses have been experienced, the loan companies have kept loans very low. Such a practice is tacit admission of undependable appraisements. Safety is gained at the expense of the borrowing farm owners. During the depression, farmers were not given the credit to which they were entitled on the basis of their security because lenders did not have appraisal systems which determined values permitting both safe and fair loans. Under such circumstances lenders naturally sacrificed fairness to increased safety for themselves. Such practices caused individual states to set up loaning agencies and to pledge the state credit to protect the purchasers of the farm-loan securities. This form of philanthropy is unwise, but in the face

of the breakdown of the ordinary appraisal methods and consequent restriction of credit, it seemed the best thing to do. Of course, there are some "farms" in almost every district which are unable to support loans. No system of credit machinery or appraisal methods could do anything in these cases. But many farms on which loans were refused were of sufficient value to warrant the granting of loans, had appraisal procedure been of sufficient reliability to furnish correct valuations. Present loaning agencies, in order to give proper service, must arrange to make more loans and in many cases must loan a larger percentage of appraised value; *but they must know what they are doing when they do it*. This can be accomplished only by the development of more scientific methods of farm-land appraisal, and must not be attempted until such a system is available for use.

The needs for accurate appraisal extend to other fields than farm-mortgage lending. One of the most important other needs is the appraisal of our farm lands for taxation. The economic utilization of land depends upon an understanding of its value. The United States is approaching a point where its land resources must be used to the highest economic advantage. Land values determine what are their best uses. Their correct determination, therefore, as a guide for land use is one of the important functions of a scientific appraisal system. Such values also would furnish a guide to buyers and sellers of land and would prevent to a considerable degree the tendency for land values to get out of line with other values. Speculative land values would thus be greatly reduced.

Land valuation in its various ramifications assumes the rôle of a question

of public interest. The development of a comprehensive appraisal system is the function of a public agency which could make the results available to all who desired them. The cost of assembling and analyzing the necessary data would be too great for a private agency. Either the Federal Farm Loan Bureau or the Department of Agriculture is in a position to make the necessary preliminary surveys, to divide the country into homogeneous areas, and to develop the essential land valuation formulas for small areas within the larger districts. After the data were once properly analyzed, it would be within the means, both in respect to cost and to personnel, of even the smaller companies to apply the methods developed by the public agencies. The task of the appraisers would consist of obtaining measurable data relating to individual farms. Personal opinion would give way to objec-

tive, precise measurements which form the only sound basis of appraising.

In conclusion, let it be made clear that farm-land appraisal is a valuation problem and as such should exclude factors which do not enter into the value of the land. Furthermore, an appraisement of land is essentially a forecast and analysis of price. This fact apparently is not fully appreciated by the mortgage companies making appraisals. The solution of the problem calls for a refined statistical analysis in which all points involving opinion or estimation should be eliminated as completely as possible. That it is possible for land valuation to be treated in this way is demonstrated by the studies cited above. Further progress now calls for an extension of the methods outlined, and the substitution of the measuring rod for the "experienced guess."

REPRODUCTION COST AND DESIRABLE PUBLIC UTILITY REGULATION

By JOHN BAUER

IN the January and April numbers of the JOURNAL, Judge William L. Ransom supported reproduction cost of the properties as the right basis of valuation for public utility rate-making, and attempted to show that the actual cost basis is not only contrary to fundamental law, but is undesirable on economic grounds.

The issue between reproduction cost and actual cost, in relation to "fair value" on which a "fair" return must be allowed, is of grave public importance. It leads to the question whether rate regulation is to be a success or failure, and whether regulation should be continued or abandoned. It has been under almost constant discussion during the last 10 years, and has been the chief object of contention in a vast amount of litigation. And, in spite of the almost endless discussion and litigation, there is no legal-economic subject which is more confused and in need of scientific clarification.

We have struggled with active rate regulation for about 25 years, and what are the results? The costs have been enormous, and desirable rate adjustments with changing conditions have been unreasonably delayed or defeated. This has been due to the undefined and redeterminable "fair" or "present" value of the properties on which a "fair" return must be allowed. There has been no clear definition or exact yardstick of "fair." Consequently, at every attempted change in rates, upward or downward, there has been sharp conflict of interest between the

public and the companies; hence the drawn-out and cumbersome procedure, the huge costs, and the unsettled decisions which have to be redetermined at the next occasion for rate revision.

For our present discussion there are two questions: (1) Does the law make reproduction cost the equivalent of "fair value" on which a "fair" return must be allowed? and (2) Should the law be changed so as to base rates definitely upon the cost of the properties?

The first is a question of law, and is answered affirmatively by Judge Ransom, while the second is a problem of economic policy and is answered negatively. But there is ample ground for disagreement with him on both questions.

I. What Is the Law?

Judge Ransom approaches the law governing the valuation for public utility rate-making from the standpoint of ordinary condemnation of private property for public purposes. His first article was thus entitled "The Valuation of Private Property for Public Uses." Ordinarily, he says, there is an actual physical taking that is direct and complete, and the municipality or public body pays outright the price fixed by agreement or condemnation proceedings. But as to public utilities, he regards the "taking" as indirect and intangible; nevertheless, the property is, through such regulation, "effectually taken for public uses." As the result

of the war, "private property in a widening number of industries has been stamped as affected with a public interest and has been conscripted for public uses."

Judge Ransom thus presents rate regulation merely as a particular aspect of private property taken for public purposes, and so applies the law of value that controls the direct taking of private property to valuation for rate-making. He would place valuation in condemnation cases and rate-making on the same basis. Let us ask whether this is the plain law, as judicially decided, or is it mere argument or assumption?

As to ordinary condemnation the fair market value of the property must be established, and the basis is the commercial value as determined by competition or other business considerations. This is *economic value* as such, and Ransom states that this "*value* must be paid if private property is physically taken, and a return must be paid upon the *value* of property devoted to public uses but remaining under private ownership." He further explains that "such *value* must be ascertained as of the time of the 'taking' of the property," and that if there is no ascertainable market value "other evidence is resorted to," and *cost of reproduction at the date of valuation* "has come to be recognized as the starting point and most influential factor."

So far as condemnation is concerned, where the taking is physical and actual, there is no disagreement. The present value must be determined and paid. This depends upon market conditions, and in the absence of a market price a fair equivalent must be reached. In fixing such an equivalent, the reproduction cost of the property is more likely to represent the present value than

actual cost. But the chief element, directly or indirectly, is *earning power*, which is not mentioned by Judge Ransom, and which attaches itself to physical property through the most important available use. But this is condemnation. What legal grounds are there for holding that the law for condemnation applies to valuation for utility rate-making?

The fundamental difference between condemnation and valuation for rate-making appears in the very nature of the property affected. Condemnation, for the most part, has to do really with *private* property, which, prior to the taking, could be devoted to any available use by the owner, who could sell it for the maximum price obtainable, or charge for the services or commodities produced whatever he was able to exact under free market conditions. This is the status of the ordinary property taken by condemnation. It is really private; it had not been subject to rate regulation, and its value is not affected by restrictions on earning power. The owner, therefore, is compensated on the basis of the full uncontrolled *value* that he sacrificed for public purposes.

Regulation Is Not Condemnation

On the part of public utilities, however, we are dealing with no such strictly *private* properties. Their basic distinction from ordinary business or strictly private property is that they are vested with a special public interest.¹ They are in their very nature *quasi-public*, and it is this fact which is the basis of rate regulation rather than any "taking" for public uses. When the properties were devoted to the particular service, such as transport, the supply

¹ *Munn v. Illinois*, 94 U. S. 113 (1876).

of electricity and gas, by that fact they acquired a semipublic character upon which the entire policy and practice of rate regulation are based. From the legal standpoint, therefore, we have to do not so much with the taking of private property, but rather with the maintenance of public rights and interests with which the property was clothed when it was dedicated to the particular public use.²

This distinction seems to have perplexed Judge Ransom, as is shown by the contradictory explanations which he makes of the act of regulation. Thus, in his introductory remarks he clearly considers rate regulation itself as the taking (pages 2 and 3). But later, when he was confronted with a more direct legal comparison he shifts his point of view and states that "public utility property is 'taken,' if and when its owners are denied the right to charge rates yielding a fair return upon its value at the time of its use in the public service."

Observe the distinction: first, the mere act of regulation constitutes "taking," while, next, the "taking" consists of failure to furnish a sufficient return upon the properties devoted to the public service. But this goes to the heart of the fundamental difference between utilities and ordinary property, and establishes the invalidity of the view that value for condemnation is the same as valuation for rate-making. Ransom fails to explain that "taking" in the sense of denying an adequate return on the properties is confiscation

and is, therefore, prohibited under the Constitution. In other words, such "taking" is fundamentally illegal, and it is for the very purpose of preventing it that the "fair value" for rate-making must be ascertained, *as a measure for the avoidance of such "taking."*

Measure of Public and Private Rights

For public utilities, the problem is to fix reasonable rates and not to confiscate or condemn private property or any other tangible thing for public uses. The reason for fixing rates lies in the already existing public interest in the properties and their operations; and this interest has been repeatedly recognized by the Supreme Court since 1876. The effect of rate-making, therefore, is not the condemnation of anything, but the conservation of existing public rights. If the rates are valid, there is no condemnation or destruction of private property. It is only when rates are unreasonable that the taking of private rights is confiscation. But this is the very thing that is illegal and cannot be done under the Constitution. Thus, the investment, or the "fair value," or the legal basis of earnings of the property, cannot be "taken." The idea of condemnation simply does not apply to what is involved in public rate-fixing or in the constitutional inquiry into the legality of given rates, for if private rights are entirely or unreasonably destroyed, the rates by that fact are illegal. The whole question, therefore, is how to measure the impairment

² From a strictly legal point of view there may be some criticism of this interpretation, since any impairment of full private rights may be construed as a "taking" of private property. The Fourteenth Amendment does not protect private property from all taking; it merely protects those rights from being taken "without due process of law," that is, without reasonable justification. But from the economic point of view, the fact is that as soon as

private property is devoted to a use in which the public has a vital interest, that property is shorn of some of its rights. Thus, in the case of utilities private rights are limited, that is, "taken," the moment the investment is made, and public rights are likewise immediately created. But "taking" in that sense is altogether different from ordinary condemnation and from confiscation in rate-making which are the present concern.

of private rights, or, more accurately, at what point rates that are fixed by public authority go beyond the legitimate public interest and encroach upon private rights; to define and fix the dividing line between the two reciprocal interests.

"Fair Value" for Rate-Making

It is true that the Supreme Court has said repeatedly that a "fair return" must be allowed on the "fair value" or the "present value" of a public utility property. But it has never said that such "fair" or "present" value must be determined on the same basis as *value* for condemnation. It has never decided or stated that for utility rate-making the cost of reproduction at the date of valuation is "the starting point and most influential factor" to which "dominant weight" must be given. It is certainly not even implied in *Smyth v. Ames*, notwithstanding the arguments of the late William J. Bryan in that case, that a public service property is "entitled to earn a return upon its *present value* and not upon its original cost, and that present value was measured by present reproduction cost." By not following Mr. Bryan, the court refused to adopt reproduction cost. The actual statement in *Smyth v. Ames* is that in determining the "value," consideration should be given to:³

. . . the original cost of construction, the amount expended in permanent improvements, the amount and market value of its bonds and stock, the present as compared with the original cost of construction, the probable earning capacity of the company under particular rates prescribed by statute, and the sum to pay operating expenses . . . and are to be given such weight as may be just and right in each case. We do not say that there may not be other matters to be regarded in

estimating the value of the property. What the company is entitled to ask is a fair return on the value of that which it employs for the public convenience. On the other hand, what the public is entitled to demand is that no more be exacted from it for the use of a public highway than the services rendered by it are reasonably worth.

This statement has been repeated and referred to almost innumerable times and, with some later amplifications as to depreciation, overheads, going value, past profits and losses, it is the law today. But it does not even mention reproduction cost. "The present as compared with the original cost of construction," may mean merely the total cost as of the date of inquiry, including "the amount expended in permanent improvements," in addition to the cost of the property originally constructed. If, however, "present" cost is taken to mean "reproduction" cost, it is presented simply as *one* of the considerations, and among the others actual cost is implied at least three times in the statement.

Reproduction Cost as an Element

While the Court has repeatedly referred to reproduction cost or has used language which probably implied reproduction cost, it has never presented it as more than an element to be considered; it has never fixed the weight to be given, nor indeed has ever stated that any particular minimum weight must be allowed, much less that reproduction cost must be recognized as the "starting point," the "most influential factor," and given the "dominant weight." But, on the contrary, it has stated that a company is not entitled to a return on the reproduction cost. In the recent Atlanta gas case, the rates fixed by the Railroad Commission of Georgia were attacked by the company

³ 169 U. S., 466, 544.

as confiscatory, but sustained by the Supreme Court.⁴ The Commission's valuation had been based preponderantly upon actual investment. The properties in existence on January 1, 1914, were valued substantially at their actual cost or cost as of that date, while those installed subsequently were taken uniformly at their actual cost. There was a further allowance of \$125,000 for appreciation in the value of land. The total valuation amounted to \$5,250,000, compared with \$9,500,000 claimed by the company as reproduction cost. The commission's findings, as well as the approval of the District Court which had reviewed the case, were sustained by the Supreme Court with the statement that

The refusal of the commission and lower court to hold that, for rate-making purposes, the physical properties of a utility must be valued at replacement cost, less depreciation, was clearly correct.

In this case, therefore, the Supreme Court definitely decided that as a matter of law "fair value" is not dependent to any great extent upon reproduction cost. While some weight had been given to this factor, the starting point or the dominant weight was unmistakably the actual cost of the properties. Search of all the rate cases passed upon by the Supreme Court in all the rate-making history fails to disclose a single instance of rates which were not sustained if in fact they produced a return of 6% or 7% upon the actual investment.⁵ It is extremely doubtful, therefore, whether the Court would find the rates confiscatory in any case, if in fact they bring a return of 6% or 7% on the investment.

⁴ *Georgia Railway & Power Co. v. Railroad Commission of Georgia*, 262 U. S. 625.

⁵ See the minority opinion by Justice Brandeis

The function of the Court is to determine whether rates are confiscatory and not to make rates or prescribe the method and basis of rate-making. The decisions themselves indicate that the actual investment is probably the dominant consideration in the mind of the Court in passing upon the question of confiscation. This certainly appears true if we distinguish *decisions* from *dicta*, taking what the Court *does* and not simply what it *says*. In the Southwestern Bell case and in the Bluefield water case, the language laid stress upon reproduction cost, but actually the rates were inadequate when measured on the investment basis.⁶ And even with the rather strong reproduction cost language in the Southwestern Bell case, the relative weight given in the majority opinion to reproduction cost was only about 20% as against 80% for the actual investment. The writer finds nothing to sustain Judge Ransom's view that reproduction cost is the *controlling* element in "fair value" for rate-making.

Capitalized Earnings

There is a further logical distinction between commercial value which controls for condemnation and "value for rate-making." For large properties which must be appraised as a single unit, the determining element of *value* is earning power. Prospective net earnings capitalized constitute the *value* as such. This may be much greater or less than actual cost or reproduction cost, and has no relation to either except as competition may keep net earnings down to an ordinary rate of

in the *Southwestern Bell Case*, 262 U. S. 276.

⁶ *Bluefield Water Works & Improvement Co. v. Public Service Commission of the State of West Virginia*, 262 U. S. 679.

return on investment. But, surely, the Court did not have in mind any such value, which would be dependent upon rates when the basis of determining the rates is to be sought. Yet, that is the basis of valuing private property condemned for public uses. Any excessive earning power above the appraisal of physical structures may be attached either to a franchise or to the value of the property available for the particular profitable use.

The part of such total value in excess of the monetary investment is usually called "good-will." It is due usually to advantage of location, monopoly position, or superior management, but it is *value* which directly or indirectly enters into condemnation. But the Supreme Court has stated flatly that "good-will" is not a constitutional factor in valuation for rate-making.⁷

New York Rent Laws

In identifying *value* for condemnation and "value" for rate-making, Judge Ransom quotes non-utility cases to support the reproduction cost basis. Thus, he discusses the New York rent laws in the light of public utility valuation. As to the facts in regard to the enactment of these laws and their administration, as well as the court decisions, and the basis of fixing rents, there is no disagreement. But as a legal matter the New York rent cases have no bearing upon valuation for public utility rate-making.

It is true that the rent laws provided for a species of rate-making, but they were enacted on the occasion of extraordinary conditions and have been viewed generally as temporary in character. The owning and renting of

houses has never been regarded, even by the rent laws, as constituting a public utility. The properties have not been vested with a public interest, in the same way as the investment of a gas, electric, or transit company. An extraordinary emergency developed for which special provisions were made in the light of the pressing necessities at the time. There is nothing in the experience to affect the fundamental law and the established course in reference to general public utility regulation.

But even if the rent laws were to be viewed as declaring the ownership and renting of houses a newly recognized public utility, the legal views laid down as to the basis of such rent-making could not be logically applied to *long recognized* public utilities. The controlling differences would be that with gas, electricity, transit, we have properties which, ever since *Munn v. Illinois*, have been vested with a public interest and, therefore, limited in their rights to fix rates for consumers, while in the rent laws we have properties, which up to the time of the enactment of the statutes, were private property, not subject to direct price regulation. Consequently, at the time of declaring such properties public utilities, the rational basis of valuation for rent-fixing would be the unregulated *value* of the properties at that time; otherwise, grave destruction of existing values would have been perpetrated.

Another important distinction is that, notwithstanding the emergency, the properties were owned in separate units by large numbers of owners, and not by a single company operating over the entire city or over a large section covered by franchise. If all the properties in a described territory are combined under a single ownership or control, it is entirely feasible to merge

⁷ *Wilcox v. Consolidated Gas Co.*, 212 U. S. 19.

all the properties acquired at varying prices at different times in the same capital account, at actual cost whenever purchased, without administrative difficulties in fixing rates. But in the case of housing, the property owned by one person might have been recently reconstructed at high prices, while the property next door would be owned by another person and constructed at an earlier date at lower prices. Naturally, the rents, except for differences in the houses, would have to be the same, and the two different levels of rent-making could not be used side by side for different ownership.

But this is the feature which distinguishes a public utility that is such in fact from another property which is not a public utility but may be brought under temporary regulation through special emergency. The controlling facts are that a public utility not only furnishes requisite public service, but has franchises, exercises special rights in streets and public places, and has a monopoly over the territory supplied. On the other hand, houses, notwithstanding the rent legislation, are owned in small units, have no franchises, and, except for emergencies, are subject to extreme competition. They are, by their very nature, not public utilities, and a declaration making them such would be a legislative violation of fact like declaring by law that white is black.

Need of Legislative Action

It is true that the courts have never clearly defined "present value" for public utility rate-making, nor have they recognized reproduction cost as the controlling element. This lack of definiteness, however, is the chief difficulty in rate-making. It has made

effective regulation impossible, and the time has come for adopting workable methods. We should look to the courts for a more definite measure and determination of confiscation, but so far as constructive rate-making as a whole is concerned, that belongs to the realm of legislation. It is high time that a survey be made by the various states into the cross-purposes and deadlock of regulation, and out of the welter of present confusion adopt clear-cut policies which can be administered so as to conserve definitely both the rights of the public and the investors. This, however, involves economic views and questions of fact as to what is most desirable, and takes us to the second part of our discussion.

II. What Is Good Policy?

Assuming the general justification of rate regulation, the question of policy comes down to the particular basis and methods by which the most satisfactory results may be attained. While there may be differences of opinion, the standards adopted in this paper are (1) that regulation should be effective, readily administrable, and not too costly, providing for prompt revision of rates upward or downward according to changing conditions and cost of operation, and avoiding conflict between public and private interest, and (2) that it should fully safeguard the investment, make needed capital available, and provide for financial stability during shifting price levels and other varying conditions affecting the industry.

Are these standards reasonable? If so, does the reproduction cost basis conform to them? These are public questions that call for dispassionate analysis based on economic facts.

Reproduction Cost Variable and Conjectural

From the standpoint of effective regulation, the objection to reproduction cost is that (a) it is a variable quantity, depending upon changing prices and conditions of construction or manufacture of equipment, and (b) it cannot be ascertained from exact facts and records, but depends upon estimates and opinion. As prices go upward or downward, either as to labor or materials, or as the technological processes of construction or manufacture of equipment change, the amount of the reproduction cost is immediately affected. But these are all unweighted factors, which are not accurately recorded, constantly vary, and hence cannot be determined without wide differences of opinion as to their quantitative significance. Consequently, every attempt to readjust the sum is accompanied by extended litigation, cumbersome proceedings, bulky records, and tremendous expense.

Since reproduction cost does not rest upon certain, definite facts, the respective rights of the investors and the public are never clear. This accounts for the sharp conflict of interest at every attempted rate adjustment and the frequency of readjustments. The companies naturally claim the maximum valuation that can be packed into reproduction cost, while the public will strive equally energetically to obtain the minimum sum. These are inevitable human tendencies, when in important financial matters the respective rights of two parties are not precisely defined and exactly maintained through accurate records.

Judge Ransom minimizes the necessity of repeated valuations under reproduction cost. But we have ample

experience to show what would happen. The procedure under outright reproduction cost would not be more favorable than under the existing "fair value." In practically every important attempt to adjust rates under present conditions, there is drawn-out litigation, involving repeated valuations and conflict of interest. Almost an infinity of cases could be cited for illustration. During a period when reductions in rates are justified, there is inevitable company obstruction, with long-delayed and often inadequate decreases. Likewise, during periods when increases should be granted, there is corresponding strenuous opposition by the public, so that often companies get into serious financial difficulties before relief can be obtained. This procedure is not only extremely costly and wasteful, but is destructive of the real interests of the investors and the public.

Did It Work During Falling Prices?

Judge Ransom asserts that the present methods of regulation worked fairly satisfactorily prior to the war, when for the most part the problem before the commissions was to obtain reduction in rates; that the decreases were readily established and that the procedure in the main worked well. But, he says, when the sharply rising costs appeared during and after the war, public opposition to the necessary increases in rates was so intense that it forced the processes of valuation and was responsible for the difficulties thus encountered in recent years. He intimates that "fair value" or reproduction cost could be administered without grave difficulties if only the public authorities were fair in their attitude toward the companies.

He is, of course, correct as to the

sharp public opposition to increases in rates during the war, and grave financial injury was done in many cases; rates were not increased when they should have been either in the interest of good service or the financial stability of the companies. But I believe he is mistaken in his assertion that the "fair value" basis worked in any way satisfactorily before the war, when the problem was one of rate reduction.

As a glaring instance of unjustified public opposition he refers to the case of an electric company against which the local administration of New York City started a petition for rate reduction three years ago. He asserts that there was no justification for trying to obtain a decrease and that the entire procedure was unjustified. As to this claim there is ample justification for a challenge. I happen personally to be well acquainted with the facts and my belief is that there was reason for seeking a reduction or at least an investigation of rates. There had been decreases in prices of materials, and particularly important improvements had taken place in the industry, which together with the great increases in the volume of business had apparently resulted in lower unit costs of electricity. On these grounds a decrease in rates seemed to be warranted. Yet Judge Ransom states that the company has expended over \$3,000,000 in the preparation of its side of the case. While three years have elapsed, little as yet could be done on the public side, largely because of the company's refusal to permit the city's representatives access to the properties or the records.

No one knows when the case will be ended and what the total cost will be. But with an effective basis of regulation, the commission should be con-

stantly in a position to determine forthwith whether rates are excessive or inadequate. It has been in existence nearly 20 years, and has had constant contact with the company. Moreover, prior to the war, it had conducted a lengthy rate investigation of the company, which then opposed any reduction as strenuously as now and protracted as long as possible a decision. Notwithstanding this pre-war inquiry, and the interim contact and accounting control, the commission faces the huge and almost unmanageable job of revaluation. It will be overwhelmed with very divergent estimates, presented by the two sides, and, at least in conducting the case, can draw little assistance from the earlier appraisals and the actual accounting records. If, therefore, the one side has already taken three years and \$3,000,000 to prepare its case, what more conclusive proof is needed to demonstrate the utter futility of present methods or of regulation based upon reproduction cost?

Conflict Inevitable

The experience with this particular company presents the normal situation. When an effort is made by public authorities to obtain a reduction in rates, the company affected offers every possible resistance and at least protracts the hearings and obtains a maximum postponement of reduction. This was the common experience before as well as since the war. Almost innumerable cases may be cited. These facts are not presented in condemnation of the companies, but merely as explanations of conditions when rate decreases are sought. Nor do I believe that anything but opposition by public authorities is possible under existing methods, or under reproduction cost, when rate

increases are proposed. Conflict, therefore, is inevitable when the respective rights of the investors and the public are not clearly defined and exactly maintained through undisputed records.

If such controversies are inevitable human reactions to these uncertainties, the reasonable way out would seem to be to define precisely the respective rights of the public and investors. But Judge Ransom objects to any "strait-jacketing" of the companies or to a "mechanistic" form of regulation, and he points out that in other industries the government has not attempted to impose any such restrictive forms. In other business, however, the government does not attempt to exercise the function of rate-making as in public utilities. Moreover, in any business relation involving different parties in interest, the rights must be exactly defined in dollars and cents, established through trustworthy records, in order to make business workable. The bulk of litigation over contracts is due to the failure to define the rights of the parties and to keep reliable records.

This is the situation also in the government's relation to business. If there is a public right, it should be clearly defined and accurately presented; then there would be no difficulty of administration or of failure to treat justly both parties at interest. But, if the rights are not clearly defined and accurately maintained, there is inevitable dispute and litigation and breakdown in control.

Frequency of Revision

Judge Ransom argues that under normal circumstances when rates have once been fixed, there is no reason why they should not continue for a period of five or even ten years, without read-

justment. In many cases, undoubtedly, he is right; certainly frequent rate changes are not desirable. But as soon as particular rates go into effect, conditions gradually change, and, as time goes on, the uncertainty as to the propriety of the rates becomes greater and greater. In most instances, the shift in prices, the changes in methods and conditions of operation, and the increase in volume of business will warrant a revision at least every five years, even when there are no great economic revulsions as those produced by the war. But, whenever such readjustment is attempted, and the reproduction cost standard used, a definite yardstick with which to measure the changes is lacking.

The problem of periodic rate revision has become particularly intensified as the result of a recent decision in which the Supreme Court has now gone so far as to prevent the use of the "depreciation reserve" as a medium for equalizing depreciation charges from year to year. It had been assumed that since depreciation charges must necessarily be based on estimates, any excessive reserve accumulated during a period of years might be drawn upon later when the commission found as a fact that the accumulation had been excessive. But the Court now rules that rates must be based upon full current costs, and no part of such costs may be taken out of earlier accumulations although provided, in part, for that purpose. This decision takes away from the commissions, under the present system, all flexibility in providing for reasonable rates for any considerable period of time. It becomes practically necessary to fix rates on an annual basis. Any excess paid by the public during one period, whether in the form of surplus or even operat-

ing reserves, cannot as a legal right be drawn upon later; nor can any deficiency in return be made good through subsequent rates. The regulatory bodies, therefore, if they are to perform their duties completely, have the extremely interesting, if somewhat baffling task, of basing rates upon the full current costs, which, however, cannot be determined until after the close of the period in question, and also of allowing a return upon the "fair value" which requires an indefinite period for determination and is already invalid when the determination is completed.

Definiteness of Actual Cost

All these difficulties, delays, and uncertainties in rate-making can be avoided, if valuation is based definitely upon the cost of the properties, and if direct provision is made for equalization of return from year to year. When a unit of property is installed, or when an extension or improvement in plant is made, the fact is a definite physical thing and the amount paid is an exact sum. This figure is entered into the accounts and becomes a permanent record, which under commission jurisdiction can be accepted without dispute. If all property costs are thus accurately recorded and if on the retirement of every unit of property its original cost is taken out of the accounts, and if, further, the properties are adequately maintained and complete depreciation reserves provided, the amount of the investment or rate base would be constantly shown by the accounts. Any competent accountant could inform the commission immediately upon request what the amount of the investment in any company is, whether a fair return has been earned, and whether rates should

be increased or decreased. Provisions could be made for adequate accumulation of reserves, so that rates would not have to be changed for considerable periods of time. The rights of the investors would be accurately defined and exactly expressed by the accounts. Rate-making would be practically an automatic process.

The actual cost of the properties, together with a proper provision of reserves accumulated through operation, furnishes the only effective rate base by which rates may be readily adjusted as reasonably required, and at the same time the interests of the public and the investors may be definitely conserved. It is, of course, true that if such a basis were now adopted by legislation without any adjustments, it would probably cause certain hardships and unfair results. In most instances it would be necessary, first of all, to make an appraisal of all existing properties and rewrite the property accounts accordingly. In making such an initial valuation of existing properties, it would be necessary in the interest of fairness to recognize the change in the purchasing power of money so far as this actually affects any of the investors. It would be entirely feasible to determine the proportion of the investment that had been supplied by the common stockholders, and to this amount make an adjustment for the relatively higher price level at the time of the valuation compared with the date of the actual stock issues. This would provide approximately the same purchasing power for the return on the common-stock investment as was fairly expected at the time the securities were issued. So far as the bondholders and preferred stockholders are concerned, however, there is no reason for making any such adjustment in the portion of their

investment, since in any event they would obtain only the contractual rate of interest or limited dividends. If adjustments were made on their investment, they would not get the benefit, and there is no reason, on the grounds of justice, for giving the stockholders an addition based on any investment other than their own.

If the existing properties were appraised at actual cost, with reasonable provision for all necessary overheads, and with an adjustment for stockholders' investment as just described, all the security owners would be fairly treated and no possible claim could be made that there was confiscation. If these amounts were then taken into the accounts and all additional investments added, we should have a definite rate base for the future. Rate-making would be a simple and almost automatic procedure. It could be readily administered and the commissions would be free to use their energies for other and more constructive matters of regulation—establishing better standards of service, and promoting efficiency of operation.⁸

Financial Stability and Changing Prices

The second general objection to

⁸The problems of administration as well as financial stability are comprehensively discussed in the author's *Effective Regulation of Public Utilities*, Macmillan Company, 1925.

⁹This statement assumes that prompt adjustments would be made in rates with changing price levels. But, of course, long lags would take place, so that the economic consequences would be affected according to the particular circumstances. During rising prices the common stockholders would suffer, and during falling prices they would gain to the extent of delay in rate revision. But as changes are made, after the delay, the stockholders would unduly benefit from price increases and suffer from decreases. In any event, however, the

reproduction cost is its failure to provide for proper standards of financial stability in the industries affected by regulation. It would promote speculation during one period and produce financial disintegration during another. It would, in turn, attract unnecessary capital and then retard the desirable flow.⁹

The fact is usually overlooked that by far the greater proportion of the actual investment in public utility properties has been made through bond and preferred stock. A reasonable estimate is that at least 75% of the cash capital was furnished by these securities, and only 25% or less by common stock.¹⁰ In many instances the proportion of common-stock investment is even less, and there are important cases where all the money put into the property is represented by limited return securities.

Because of such normal financial structure, with the large percentage of fixed-return capital, any change in the return on the investment has a cumulative effect upon the common stock. If in any case 75% of the capital funds have been contributed by bonds and preferred stock and only 25% by common stock, then during rising prices the reproduction-cost basis would result in a fourfold monetary increase in the

financial results are bad whether viewed from the standpoint of prompt rate changes or the inevitable lags in the adjustment.

¹⁰Bauer, *Effective Regulation of Public Utilities*, pp. 122-129. See also Dorau, H. B., "Public Utility Financing, 1919-1925," *JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS*, Vol. I, p. 310. Over the six-year period 25% of the total volume of securities issued was stock, the annual percentages ranging from 7.8% in 1919 to 34.1% in 1924. However, comparing issues of stock for new capital and all security issues for new capital, the percentage of value of stock issues to the total for the six years was 30%. Moreover, 46% of the value of all stock issues during the six years was preferred, and 54% common.

common-stock return. The adjustment provided on the bondholders' and preferred stockholders' investment would go to the benefit of the common stock exclusively. If, therefore, we should have a 50% increase in prices, there would be a 200% increase in return on the capital stock investment, while the return on the bond and preferred stock would remain unchanged. Consequently there would be rapid increases in the common-stock values, with the result of great speculative activity, which would tend to overstimulate new and unnecessary investments in public utility properties.

During a period of falling prices, exactly the reverse course would take place. The entire investment would be reduced by the proportion of decrease in prices, and the total return would be reduced accordingly. But since the interest and preferred dividend obligations would continue the same as before, the balance available for the common stock would be diminished by a fourfold rate compared with falling prices. Hence any substantial decrease in prices would seriously cut into the stock values and would soon affect the bonds. A 25% fall in prices below the actual investment level would wipe out completely any income upon the common stock, and a further decrease in prices would bring about insolvency and a receivership for the company. Such a condition would not only discourage otherwise desirable utility extensions and retard the flow of otherwise desirable capital, but would make impossible the rendering of proper service by the existing properties and restrict the normal growth of business.

The plain fact is that the reproduction cost basis could not be maintained through a long period of falling prices, such as occurred during the 30 years

after the Civil War. If now, at the relatively high price level, we were to proceed with a gradual decline for the next 30 years, amounting to a total of 45%, practically every railroad and public utility company would go into the hands of receivers. There would be extreme chaos, and the particular basis of rate-making would have to be abandoned. Reproduction cost simply would not stand against a long period of falling prices. But, if it promotes speculation during one period and financial disintegration during another, it is manifestly unsuited for a permanent basis of rate regulation, even if it could be effectively administered without constant conflict between public and private interests.

Except for the requirements of effective regulation and sound financial standards, I should agree with Judge Ransom that reproduction cost corresponds more nearly with the general economic transitions produced by changing prices. It is true that generally in ordinary business it agrees more nearly with the "fair value" than actual cost. But, it seems to me, this is not the criterion in setting up a basis of rate regulation. If we wish to regulate rates we must take measures which will make regulation effective, and which under the controlling financial structure will provide for financial stability. These conditions are met by the actual cost basis, which would provide not only definiteness, preserving exactly the rights of investors and public, and making rate adjustments readily administrable, but it would also prevent speculation during rising prices and financial collapse during falling prices, and at all times would assure an adequate flow of new capital for the normal growth of business. It is the only available basis that will work.

Can Financial Stability Be Assured?

Judge Ransom argues that even if the actual cost basis were adopted at the present level of high prices, though he did not consider such an adjustment of stockholders' investment as I have proposed, there would be no guaranty of that basis being maintained through a period of falling prices. As he conceives the situation, the companies would merely be prevented from getting an upward adjustment on their return during one period, while during the reverse they would be forced to accept a lower return on the lower level of prices.

This, of course, is mere assumption. It is true that no one in urging constructive economic legislation can guarantee that any particular course will stand permanently as future policy. If, however, a thorough canvass of the present confusion were made, and definite policies for future rate-making were adopted, as here outlined, there is little reason for assuming that the public would repudiate its *quasi-agreements* at a later time when lower price levels are reached. If the statutory provisions are based squarely upon the financial facts, there would be no ground for public discontent and abandonment of a course deliberately adopted. Discontent which results in the abandonment of a previously adopted policy is usually due to inherent difficulties or injustice which lead to abuses. A policy which rests upon sound public requirements is not likely

to meet an insistent demand for reversal. The public at large is fairly considerate of the legitimate rights of the various classes. Public ruthlessness usually follows only upon group irresponsibility.

Because of the inherent reasonableness of the proposal, it would unquestionably have the permanent support of the public and would be beyond political attack. The existing properties would be definitely appraised, with fair consideration to stockholders' investment, and with a reasonable adjustment of every conflict, and then a permanent sum would be placed in the accounts of the companies. Subsequently any additional investment would be furnished under exact terms known to the investors and subscribed to by the public. This very definiteness of a *quasi* contract would give reasonable assurance that the course adopted would be pursued even during a period of falling prices.

Moreover, even if there should be a disposition to object against a fixed valuation during declining prices, the investors would be better protected than now because the terms at which they furnished capital would have been prescribed by statute. Consequently they would rely upon *quasi* contracts which, presumably, would be enforced by the courts. If political influences sought the abandonment of the actual cost basis, the investors would have judicial protection because they were induced to make the investments at terms stated by statute.¹¹

¹¹ Judge Ransom states that public representatives have not been willing to allow a return upon actual investment, if this was greater than the reproduction cost. I do not believe that he can cite a single such instance, provided that the investment had been prudently made. During the period of active regulation, since 1907, we have been dealing generally with rising prices, so that

there have been few instances (I know of none), where the prudent investment exceeded the reproduction cost. When, however, actual cost was objected to by public authorities, the amount was deemed excessive because of extravagant or imprudent expenditures or because the book charges represented security issues or excessive values allowed for property instead of cash cost deter-

Adjustment of Return Small Element in Rates

The force of falling prices, however, upon the valuation is easily exaggerated. It would have no dominant influence upon the rate base and much less upon the actual rates fixed. Prices never drop so sharply or suddenly as is assumed by Judge Ransom. Except immediately following sharp increases during a crisis or war, declining prices are characterized by gradual decreases, which are hardly perceptible year by year. Prices may jump up sharply; and then they are likely to recede sharply. Except for such revulsions, which, in any event, cannot be practically reflected in a rate base, falling prices are gradual and produce no sudden economic transformations.

This fact contributes to the stability of the actual cost basis and adds assurance that the basis would be maintained. If we were to experience a long course of declining prices as followed the Civil War, then gradual improvements, additions, extensions, and renewals would be made to the properties at prices prevailing as construction takes place. Hence there would be a steady adjustment in the total capital charges to the lower price level. At the close of the period the capital account would reflect, not costs at a remote high level, but average costs, including a large proportion for the immediately preceding years of relatively low prices. At no point, therefore, would there be any critical occasion for public objection against the actual cost basis.

As we look into the future, however,

there is no particular reason for assuming either falling or rising prices. While we are certain to experience shifting prices, the course may be upward or downward; no one can predict safely even for a five-year period. In the face of this uncertainty the actual investment appears especially necessary to preserve financial stability and prevent conflict of interest in rate adjustments.

It is easy, moreover, to exaggerate the significance of the allowance for return in the total requirement for rates paid by consumers. In most instances the requirement for return is not over 25% of the total rate provision, which includes operating expenses and taxes, as well as return on investment. The first two elements constitute in all cases the greater proportion of the charges paid by consumers, and they are now based upon actual cost. If, therefore, we keep in mind that during any period of changing prices there is a steady adjustment of capital account to the changing level, because of additions, improvements, extensions, and renewals, we see that the final effect upon rates cannot be great whether we use reproduction cost or actual cost, provided that the amounts were scientifically established and rate adjustments readily made. The difference during any period of gradual changes would not amount to over 5% or 10% in the general rate level.

The irony of the present situation, as it would be under reproduction cost, is that all the confusion and deadlock are due to a relatively minor element in the total rate content. They are due

(Footnote 11 continued from page 421)

mined by market conditions. This was the chief objection to actual cost in the early railroad cases, including *Smyth v. Ames*, and not the advantage gained from lower reproduction cost valuation, although this factor was mentioned in argument by

W. J. Bryan in the *Smyth* case. The Supreme Court, however, did refer to unwarranted and inflated actual costs, especially as reflected in the accounts, while it never referred to reproduction cost or "fair value" as "a basis of obtaining for consumers any benefit from falling prices."

wholly to the variable and contentious character of the return. But during a prolonged rate inquiry, the failure to make prompt adjustments involves not only the returns but also the charges for operating expenses and taxes. During falling prices, therefore, consumers are required to pay excessive rates not only for the return element based on valuation, but also for operating expenses and taxes. But during rising prices the companies, because of drawn-out procedure, lose financially on all three elements. Undue profits are thus balanced by unwarranted losses, while consumers pay excessive rates or receive inferior service.

Since, however, the bulk of the rate elements are already based upon cost, why not place rate-making definitely upon cost in all respects, so that all factors may be determined from the accounts and prompt rate adjustments made? If this were done, there would probably be less lag in adjusting the return to investors according to changing price level than under the present cumbersome procedure or under reproduction cost.

Would There Be Inconsistency in Rate Structures?

The argument is sometimes made against actual cost, that it would result in inconsistent and conflicting rate structures between properties installed at different levels of prices. Judge Ransom thus presents the case of a community where Y Company has built an electric light and power plant at present high prices, while in the same community Z Company has a similar plant "of like efficiency and capacity" constructed years ago at a much lower range of cost. He asks whether the patrons of Z Company

may compel it to furnish service at rates which yield only one-half the return over and above operating expenses compared with Y Company.

This illustration shows excellently the logical impropriety of the assumptions usually made against the practical application of the actual cost basis. Naturally any particular economic policy must square with the facts with which it is concerned. If the normal conditions in the electric industry were those represented in Judge Ransom's assumed cases, the actual cost basis would not work as the basis of public utility regulation. The companies as presented, however, appear as ordinary manufacturing enterprises, struggling for business under competitive conditions. Under such circumstances there would be no reason for regulation, and the companies should be left free to fix their own charges. They would then use neither actual cost nor reproduction cost, but would charge what the traffic would bear, within the limits of a competitive market. The illustrations as given are not public utilities at all. A real public utility has a franchise covering an entire municipality, or a number of municipalities, or at least a large and definitely defined area. Within its own territory it has a monopoly and cannot come in competition with another company whose property may have been installed at a different level of prices. If its property has been installed at a high level, its return would naturally be based upon the actual high costs. Another company, operating elsewhere, where property was constructed at lower prices, might have its return based upon the lower costs. The two companies would not affect each other by their different range of charges, but in each case the consumers would pay the

actual cost of capital devoted to the service.

But even the situation as just considered in the preceding paragraph is unreal. Actually we do not deal with properties built exclusively or predominantly at a high level of prices, compared with others constructed at a low level. While there may be such contrasting instances, they are extremely rare. The normal properties now existing, for which our policies must be shaped, involve parts or units installed at various prices, extending ten, twenty, or more years in the past, while the relative proportion constructed during each period diminishes with the remoteness of the past. In growing communities, there is probably little difference in the average constituents of the parts built at the various levels of prices. Consequently, even if we had to deal with two somewhat competing properties in the same community, there would be no great difference in the relative rate level due to the time element in plant construction. Any disparity in rates would be due to operating conditions rather than to differences in the level of return.

To show the complete lack of applicability of Judge Ransom's assumptions to the question whether the actual cost basis would result in impracticable differences in rate level, it is worth while to point out that his very hypothesis is a technological impossibility. He places side by side two plants of "like efficiency and like capacity available," one just completed at present high costs, and the other "built years ago" at a cost of "only half of the present cost to build the plant" of the other company.

But the plain fact is that, in view of the enormous changes in the electric industry, we could not have two plants

built at widely different periods and yet have "like efficiency and like capacity." A plant built today would be in every important technological respect different from one built before the war. Such earlier plant would not have a single generator of over 10,000 kw. capacity, whereas the modern plant would have generating units of 75,000 kw. or even greater capacity. If the plants, therefore, have a "like capacity" of say 200,000 kw., the new plant would probably have two large 75,000 kw. units, and possibly two smaller units, while the old plant would consist at best of twenty 10,000 kw. units, but would probably have a lesser number of 10,000 kw. and the rest with smaller capacity.

If the two plants, therefore, have "like capacity," they cannot have "like efficiency." They would be wholly incomparable; the old one would be obsolete and under the assumed competitive conditions would be forced out of business. Its production costs would be so high because of low efficiency, that it would have to be scrapped notwithstanding the lower level of prices at the time of its construction. Moreover, the new plant would have a lower actual investment per kw. capacity although constructed at the higher general price level, so that the return element in the rates would be less than for the old plant built at the lower level. If the two plants were really of "like efficiency and like capacity," both would be modern, with their major generating units dating back not further than 1920, and both would contain the same relative proportion of investment at the various price ranges. And this is the situation in the great majority of cases where their relative investments are involved in the relative rates charged for service to consumers.

Would the Companies Be "Strait-Jacketed"?

Another point urged against the actual cost basis, especially against the proposal of making rate adjustments automatic through accounting control, is that the companies would be "strait-jacketed," and the owners would be stripped of the function of ownership.

This objection properly requires much more discussion than is here possible. There is no doubt that regulation impinges upon management, and it does so in the most vital respect. Whenever a producer may not charge for his product what he can exact from his customers, he is deprived of the major power of ownership which prevails in ordinary business. But this paramount power was taken from the utilities many years ago, when the inherent public interest was recognized in *Munn v. Illinois*. As for other phases of management, we have merely a question of policy to what extent the personnel in charge of operations shall have full responsibility and power, and how far they shall be subject to public control or cooperation.

Under effective regulation on the basis suggested, the companies would be just as free as they ever have been to exercise the ordinary duties and responsibilities of furnishing service. The only difference would be that they would have their return fixed on a definite and administrable basis, and would be thus freed from the conflict of rate adjustments. Otherwise they would still have the task of planning improvements, additions, and extensions, maintaining proper standards of service, and promoting efficiency of operation, and they could meet these responsibilities much more successfully if

not involved in incessant controversies. The commissions, likewise, could devote much more time to questions of service and efficiency, and with their technical staffs could cooperate with the active management in promoting better and more economical service. They would not in any sense replace the management, but they could assist greatly in obtaining progressive efficiency of management.

There is, however, another phase of the "ownership" question, which frequently leads to confusion of words with facts. Who are the "owners," who might be stripped of the function of ownership and management?

The fact is that to a large extent, and, many people think, to an astounding degree, the real power of control does not rest with the people who have put the actual capital into the business. In the first place, let us call attention again to bondholders and preferred stockholders, who on the average furnished 75% of the investment, and, of course, are deprived of any share in management. Further, when the common stock is widely distributed as is the case in modern utilities, the great majority of owners never appear at stockholders' meetings and surrender control to a few persons armed with proxies. Thus, ultimate management rests with people who have comparatively little money in the business. But there are still further developments which have attained far-reaching and perhaps dangerous phases—the fast expanding holding companies, control by management and finance corporations, the issuance of non-voting common stock, dominance by banking syndicates, and so forth. Through such modern financial and legal devices, as has been forcefully brought before the public by Professor W. Z. Ripley, of

Harvard University, the people who finally exercise control are likely not to have a great amount of cash in the business and, therefore, have chiefly speculative interests in the operation. The security holders who furnish the capital and who are the *real owners* of the property have directly or indirectly accepted *fixed return certificates* and have surrendered the rights to management.

Responsibility to Investors

This situation has been developing gradually for many years, but has advanced with leaps and bounds during the past few years. It furnishes a serious problem which requires extensive investigation and study. Perhaps it is inevitable and cannot be prevented. Probably there is no way by which the actual owner of capital may be compelled to exercise the functions of ownership by taking control of management. At present, however, the great majority of utility investors do not share in the direct control and management of the properties. They have put their money in what they consider safe semipublic securities, and have accepted a fixed return without thinking of themselves as owners or managers.

This is the situation with which we must deal, and which points directly to the actual investment basis of return. It practically requires that the commis-

sions will have to assume double responsibility to the public; not only to the consumers, but also to the actual investors in the business. Under regulation as heretofore conceived, the public interest was recognized chiefly, if not altogether, from the standpoint of reasonable rates and service. But with present developments, when the general public has investments in the utilities without any share in management and when actual control is in the hands of semispeculative groups, the recognized public interest should be extended to all *bona-fide* investors in the properties. Regulation, therefore, should be concerned not only with effective policies and machinery for rate-making and problems of service, but also with provisions for permanently safeguarding the investment.

All these considerations show positively that the time has come when mere playing with regulation should cease. The game is in every way too expensive. We must make it a business and use clear business policies and methods. In the writer's opinion, this means basing rates definitely upon cost in every respect, including return as well as operating expenses and taxes. This meets the requirements of effective regulation and the maintenance of financial stability. It would not only treat the investors squarely but would protect them as holders of quasi-public securities, and would minimize conflicts over uncertain public and private rights.

THE FINANCING OF NON-GOVERNMENTAL IRRIGATION ENTERPRISES

By R. P. TEELE

THE financing of the reclamation of desert lands is a difficult problem because both physically and economically desert land must be reclaimed in large units; and they are uninhabitable until they are reclaimed. Except for small areas here and there, it is not physically possible to build irrigation ditches to water single farms. Most irrigated farms are miles from the streams from which the water for their irrigation is taken. A stream of water only large enough for a single farm of 160 acres would be lost by evaporation into the desert air or by seepage into the desert soil long before it reached a farm only a few miles from the source, while the cost of an independent ditch for each farm would be prohibitive. Only by the use of large canals watering many farms is it possible to carry water through the long distances necessary to reach the lands far back from the streams at an expense that is justified by the returns from the land.

Thus, from the very nature of things, agricultural expansion into deserts cannot be accomplished in that gradual way that is possible in other sections where single farms can be cut out of the forests or plains and developed gradually as there is demand for their products.

Furthermore, since the land is uninhabitable until irrigated, there must be very large expenditures in advance of settlement; that is, before those who are to repay these expenditures are on the land. Usually these expenditures are

made before it is known who is to occupy the land and repay the cost of reclamation. Therefore, investment in reclamation is highly speculative. It involves not merely the construction of reclamation works, and the relation between the cost of such construction and the intrinsic power of the land to produce crops, but the obtaining of settlers who have the ability and the capital necessary to create farms that will produce the means of repaying the cost not only of the construction of the irrigation works but of all those other improvements that go to make a farm from a portion of the wilderness.

The conditions described complicate the problems of the settler on reclaimed land as well as those of the promoters of reclamation enterprises. In other sections expansion naturally takes place on cheap lands. At the time of settlement the land does not represent a large investment, and, consequently, carrying charges are not large. A settler and his farm and his family can all develop together, gradually, through a period of years. On reclaimed land interest on the cost of reclamation and the cost of operation and maintenance constitute a heavy charge on every acre, and every acre must be brought into cultivation quickly if the settler is to meet the cost from the products of his farm. A gradual growth, such as took place on cheap land, is fatal to the settlers and to the enterprises supplying water.

These conditions did not exist so long as irrigation was confined to small

areas adjacent to the streams, where single farmers or a few neighbors working together could build a ditch with their own labor and very little expenditure of money. They do not now exist where water is obtained from wells that supply single farms or a few adjoining farms. Works of the class just referred to supply water to about one-third of the irrigated land in the United States.

The enterprises supplying water to the other two-thirds of the irrigated land have required some kind of financing. This article deals with the methods used in financing irrigation enterprises other than those carried out under the Federal reclamation law. The latter supply water to something less than one-tenth of the irrigated land in the country. The enterprises discussed here cover about 60% of the total irrigated area.

Historical Development of Private Irrigation

The earliest irrigation enterprises in the United States were the old community ditches of the Southwest. Their beginning is lost in antiquity, and it is not known how their construction was financed, if at all. It is probable that they were built by some of the early Spanish colonists by their own labor without the expenditure of any money to speak of.

The Mormon church was probably the first institution in this country to build irrigation works on any plan requiring financing. Under the plan adopted by the Mormons the church organized colonies and furnished whatever money was necessary for materials and supplies while the colonists did the work. The ditch enterprises were organized as stock companies, and stock

was issued to the colonists in payment for their work, while the church took stock in payment for its expenditures. The stock taken by the church was disposed of to later settlers, so that the ditch companies became truly cooperative. These enterprises in Utah were comparatively small. The Mormon stock companies became the model for the most common type of organization for controlling irrigation enterprises in this country.

The first settlement in Utah was made in 1847. For 20 years, only small ditches were built, but during that time many large enterprises were planned. Nothing was accomplished, however, presumably because of the lack of a satisfactory system of financing. This experience led to the passage, in 1865, of the Utah irrigation district law—the first irrigation district law in the United States. From the standpoint of financing, the distinctive feature of this law was that districts organized under it were permitted to tax the lands within their boundaries to raise the cost of providing a water supply and to meet the cost of operation and maintenance. After preliminary organization, the formulation of plans, and the making of estimates of cost, an election was called and the electors within the district were permitted to vote on the question whether they were willing to agree to a tax on their land, on either an *ad valorem* or an acreage basis. A two-thirds vote was required to carry the district organization. This law did not provide for the issuing of bonds by districts. A large part of the valley lands of Utah were organized as districts under this law, but practically nothing was done in the way of building canals. The lands had no productive value until the canals were built and the lands were

brought under cultivation. As a consequence, a tax of sufficient amount to build irrigation works could not be collected if levied.

So far as the writer is informed, this is the first attempt in America to make desert land provide directly the means for its own reclamation, although drainage district laws involving this principle had been in existence for many years. This act involved the fundamental idea of the district—the forcing into the district of all the land that would be benefited, provided the owners as a group desired it. It provided also for the use of the taxing power of the state to enforce the contributions from the land. Aside from the inherent weakness of attempting to make land that has little or no value security for considerable sums of money, the Utah law had the further handicap that at the time of its passage the occupiers of the land in the state had no legal title to their holdings. At that time there was no United States land office in Utah, and the settlers had only squatters' rights. Consequently the land could not be sold for taxes and there was no real force behind the law. There was the further weakness that the law did not contain the bonding feature, which is, in effect, a means of postponing for a period of years the payment of the cost of construction.

After the failure of the district plan there followed in Utah an era of public aid in construction. In 1872 the county of Salt Lake built a diversion dam in Jordan River and during the next four years made appropriations for aiding in the construction of several canals. Although the county records do not show this fact, it is probable that these contributions by the county met a large part of the needs for cash, and that the

landowners supplied the labor, as they had done when the church was directing colonization.

Historically the next step beyond the Mormon plan of colonization was a colony plan based not on a common religion but on community of interest in other lines, exemplified by the Union Colony at Greeley, Colorado. This colony was founded by N. C. Meeker, a writer on the *New York Tribune*, with the backing of Horace Greeley.¹

Meeker made a trip to the Rocky Mountains and, on his return to New York, formulated the idea of founding a colony in Colorado. This was discussed with Mr. Greeley, who gave it his approval, published notices of meetings, and gave it editorial support. A meeting was held at which the plan was discussed and an organization perfected. Each member was to pay \$5 for current expenses and also to hold, subject to the call of the treasurer, \$150 for a purchase fund for the land to be bought. This seems to have constituted the financing of this colony.

The author cited² gives the history of this colony in great detail, showing that the cost of land, the cost of irrigation works, and the quantity of water needed for irrigation were all very greatly underestimated. The promoters and the colonists were equally ignorant of irrigation practice and cost. The colonists were brought onto the land, inadequate ditches were built with the funds in hand, and the colonists fought their way out as best they could; by levying assessments, by doing the work themselves, and by other makeshifts. The whole enterprise was cooperative, and the colonists were not being ex-

¹ Boyd, David, *A History of Greeley and the Union Colony of Colorado*, 1890.

² David Boyd.

ploited by any one for his own benefit. Aside from this latter feature, the history of the Union Colony is the history of many irrigation enterprises—settlers lured onto land through underestimates of cost, overestimates of possible returns, and ignorance, or through misrepresentation and fraud, but gradually working out a high-class development.

Commercial Irrigation Enterprises

Following the Union Colony in Colorado came what have been classed in the Census reports as commercial enterprises. Their plan was to sell stock and bonds to obtain the funds for construction, and to pay off their obligations and make a profit through the sale of water rights alone or with land. The water rights sold conveyed no interest in the works but merely entitled the purchaser to water upon the payment of annual charges to cover the cost of operation and maintenance. Thus the scheme contemplated the permanent operation of the works by the construction companies. The wide difference between the value of the unimproved desert land and that of irrigated farms made it appear that there was a large amount of value that could be appropriated by the agency supplying the water that made this increased value possible. The land without water was of little value; with water it was highly valuable. It seemed logical that the party supplying the water could demand and get a large part of this value. Almost without exception, however, such enterprises were failures because of the mistaken idea that the water almost alone created the increase in value, while, as a matter of fact, the development of the farms, the cost of which was as large as the increase in value in

many instances, had as much to do with the new value as did the water supply. This development was not possible without the water, but the increase in value was not possible without either the water supply or the improvement of the land.

A further cause for the failure of this scheme was overestimating the demand for water. It seemed that since land was valueless without water and valuable with water, the owners of land must purchase water rights. However, the landowners were in far the stronger position for bargaining for water, since their land represented a very small investment and almost no carrying charges. They had only to wait a few years at most for the companies to become bankrupt and then buy in the canals at a small part of their cost.

The Bear River Canal, at the northern end of the Great Salt Lake in Utah, is a good example of this type of enterprise. The following statement regarding this enterprise is taken from the story of its development given by President George Thomas, of the University of Utah, in his *Development of Institutions under Irrigation*.³

A corporation was organized in 1889 with a capital stock of \$2,100,000. President Thomas says: "So far as can be determined this was pure promotion stock and the only thing B——paid for it was certain water fillings and rights of way."⁴ A part of this stock was turned over to a mortgage and trust company of Kansas City, Missouri, to underwrite and finance the new company. A mortgage in favor of the trust company for \$2,000,000 was placed on the dams, canals, and so forth, that were to be built. Bonds were then sold

³ The Macmillan Company, New York, 1920.

⁴ Thomas, George, *op. cit.*, p. 207.

to obtain money for the construction of the system. They were secured by a mortgage on the canals and other property of the company and also were underwritten by the trust company. A large quantity of these bonds was sold to Quakers in Scotland and England, this being almost the only source of revenue for the construction work.

President Thomas gives the details of mechanics' liens, expenditures for advertising, speculative landholdings, litigation, and so forth, and states that in 1902 the Utah-Idaho Sugar Company bought the canal system for \$300,000 and the land for \$150,000. He describes the conditions in 1920 as follows:

Under the North and South canals there are now about 45,000 acres under irrigation and cultivation, while the two systems are capable of supplying 90,000 to 100,000 acres.

The system cost well over a million and a quarter dollars. In addition to this, in the numerous lawsuits and years of long-drawn-out litigation, there was considerable money wasted. The bond-holders were the heavy losers. They lost almost their entire investment. A combination of circumstances seemed to make it impossible for them to realize the legitimate returns that they were honestly entitled to. For they had supplied the funds to establish what later proved to be a highly profitable enterprise. From the standpoint of the water supply, engineering construction, and fertile agricultural lands the opportunities were unsurpassed. Then why should it have failed to bring returns? First, the company was organized on a highly speculative basis—all the stock and one-fourth of the issue of bonds went to the promoters. That was certainly a considerable amount of "water" to put into a company of that size in the hope that it would survive and prosper.⁵

The story of the Bear River Canal is the story of scores of canals throughout the West organized in that era. The others differ in details, but only in details.

One of the companies organized to supply water on a large scale to land that it did not own was the Wyoming Development Company. This company began operations in the eighties, on a tract of land about 75 miles north of Cheyenne, Wyoming, and is still operating its system, and not all of the land had been settled in 1925. The writer visited this enterprise about the end of 1924 and found plans for colonizing the remaining lands being discussed. The leading figure in this enterprise was J. M. Carey, a governor of Wyoming, and later a United States senator from that state. Judge Carey's experience with the Wyoming Development Company led him to the conclusion stated by Doctor Thomas in his discussion of the Bear River Canal, "If the public lands could have been segregated and set aside . . . where the water charges became a lien on the land it would have been a great help. . . ."⁶

The "Carey Act"

While Judge Carey was in the United States Senate he secured the passage of a law making it possible to do just that thing. The law, enacted August 18, 1894, bears the name "Carey Act" for its author. This act was in the form of a rider on the sundry civil bill for that year and does not disclose the real object nor outline any method of operation. It grants to each of the states containing arid land 1,000,000 acres of land on condition that the states provide for its reclamation. It is obvious that the law is inoperative in any state until the state has accepted its terms and made application for the segregation of land.

⁵ Thomas, George, *op. cit.*, p. 216.

⁶ *Ibid.*, p. 217.

The Federal law leaves the whole plan of operation to the states. Although the state laws differ much in detail, they are alike in general plan. All operations under the laws are placed under the supervision of state boards, in some instances under existing boards, and in other instances under special boards created for the purpose of administering this law. Any person or corporation desiring to reclaim land under this law applies to the proper board, specifying the lands that it is desired to have segregated and describing the proposed plan of reclamation. The forms of application and the information required to be furnished are prescribed by law, by the regulations of the boards, and by the regulations of the United States Department of the Interior. If approved by a state board, an application is submitted to the Federal Department and the land is withdrawn from entry pending action on the application. If the application is approved by the Department, the land is segregated and withdrawn from all forms of entry under the public land laws. The state then enters into a contract with the applicant, providing for the construction of the proposed works by the applicant and fixing the terms on which water rights may be sold to settlers on the lands. On its part, the state agrees to sell lands only to those who have entered into contract with the applicant for the purchase of water rights. The water rights sold must carry an interest in the works and other property, so that when the purchase price is paid, the works and rights become the property of the water-right purchasers. This effectively ties the land and the water together, and this was supposed to overcome the difficulties experienced by earlier enterprises in

being frozen out by speculators who held the lands to be watered.

The states usually sell the lands for 50 cents per acre so that the income from the land clearly is not the object of the law.

Under the original law, as soon as any state furnished satisfactory proof that any of the lands were "irrigated, reclaimed and occupied by actual settlers" patents were issued to the state, and the state, in turn, issued patents to the settlers when they had fulfilled the conditions imposed as to actual residence and the improvement of the land and had made the full payment of the purchase price of the land.

Defects of Laws

While these laws and the contracts between the states and the applicants cured the particular evil that seemed to have wrecked previous enterprises, they did not give the financial assurance that was desired and that it appeared they would give, for two reasons: First, the laws prevented speculators from getting the land and holding it without buying water, but they did not give assurance that there would be purchasers for either land or water; and second, there was no way by which the land could be made security for deferred payments on water rights, since title remained in the Federal Government until the lands were "irrigated, reclaimed and occupied by actual settlers."

The first of these weaknesses cannot be cured by legislation or regulations. The prompt sale of water rights and land is dependent on the existence of a real demand for land, and that cannot be created by law.

It was thought that the second weakness would be corrected by the amend-

ment of June 11, 1896, under which the states were authorized to create liens on the lands "for the actual costs and necessary expenses of reclamation and reasonable interest thereon from the date of reclamation until disposed of to actual settlers," and for this purpose the government was authorized to pass title to the state as soon as an adequate water supply was made permanently available. However, none of the states has provided for making the cost of the works a direct lien on the lands.

This amendment would have failed of its purpose, even if the states had enacted the necessary laws, because the lien cannot be created until "an adequate water supply is made permanently available" and what was wanted was some way of using the lands for providing the funds for their own reclamation *before* rather than *after* their reclamation. Under the law as it now stands it is necessary for the promoters of a Carey Act project to obtain the funds for construction of necessary works in some other way and be reimbursed by the sale of securities based on the lands.

In the absence of authority to make the cost a lien on the land in advance of construction, it was sought to make the lands a basis of credit without a direct lien on them. The plan for accomplishing this was to sell water rights before construction, on deferred payments, under contracts binding the purchasers to give mortgages on their lands as soon as they should get title; and to hypothecate the notes given by the purchasers for the deferred payments on their water rights, making them security for bonds, which were sold to obtain funds for construction. The bonds and notes were deposited with a trustee, and bonds were to be sold only when notes in an

agreed amount had been deposited. Usually the amount of notes was to be considerably larger than the amount of bonds sold—125% or 150% of the amount of the bonds in some cases. It is evident that while the bonds were not sold until the water rights and lands were sold, the security of the bonds depended on the success of the settlers in producing the means of paying for the land and water. If settlers defaulted on their notes, these notes became practically worthless because the title to the land was still in the United States and there was little or nothing else behind them.

In practice there was a great deal of misrepresentation in the sale of both water rights and land. There may or may not have been legal fraud, but, practically, there was a great deal of fraud. As stated, Carey Act projects are carried out under federal and state laws, and the plans for each project were approved by some state board and by the United States Department of the Interior. Thus they actually had federal and state approval, and this fact was used to make it appear that they had federal and state guaranty, which was not true. There was, in fact, no public guaranty of anything—completion of works, adequacy of the water supply, quality of the lands, reasonableness of prices, or payment of the bonds.

In the sale of bonds it was represented that they were backed by federal and state governments and that they were a lien on the lands, when in fact the only thing behind them was notes based on contracts to make the notes liens on the lands when title should be obtained.

Millions of dollars' worth of Carey Act bonds were issued and sold, but a

large part of the money invested in them has been lost. Statistics as to the amount of bonds issued and the amounts lost by their buyers are not available, but the extent of the difference between plans and fruition is indicated by the figures given in the reports of the General Land Office. To June 30, 1925, the aggregate area applied for under this act was 8,366,801 acres; the aggregate area segregated under approved application was 3,843,290 acres; while the area patented to water users was but 1,158,926 acres, about 14% of the area applied for, and 30% of the area segregated.

The period of greatest activity under the Carey Act was 1900 to 1910. Nearly 90% of the land irrigated under this act in 1919, as reported by the Fourteenth Census, was in enterprises begun during that period, and the last year in which the area segregated was as large as 50,000 acres was 1913.

This act applies to public lands only, and, as a consequence, the opportunities for large enterprises are constantly diminishing as the public lands within reach of water supplies are disposed of.

The failure of the Carey Act as a means of reclaiming large areas of land has been due to the same cause that has brought financial failure to all the other plans of financing—the slowness of settlement. The lands were not settled promptly and made to produce the means of repaying the cost of construction. Under those circumstances it made little difference whether the bonds were a lien on the land or not; the lands could satisfy the lien only in case they were producing the means of doing so; until they were improved they would not sell for enough to pay the cost of their reclamation.

The plan of organization and financ-

ing under the Carey Act seems to have possibilities for reclaiming private lands if used by parties having sufficient funds to build the works and carry the investment until the lands have attained sufficient value to serve as security for bonds. The trouble with most of the Carey Act companies has been that the promoters expected the prospective water users to furnish almost all of the money. Sales of water rights were made before construction began and the sale of bonds based on the settlers' notes for deferred payments was depended upon to provide funds for construction. Delays in construction and delays in actual settlement brought about the maturing of obligations before funds were available to meet them. Had the construction companies been amply financed by the sale of stock, they could have survived, although not paying dividends, until the lands were developed sufficiently to be actual security for the bonds.

Irrigation District Laws

The next step logically, although not chronologically, beyond the Carey Act was the passage of state laws creating irrigation districts, with the bonding privilege, in which the bonds issued are an actual lien on the lands to be benefited. The Carey Act applied only to public lands, while the district acts, so far as making the construction cost an enforceable lien on the land is concerned, apply only to private lands. Historically the district laws antedate the Carey Act. Drainage district laws, involving the same idea, had been in existence in this country many years before the idea was applied to reclamation by irrigation. The first irrigation district law including the bonding pro-

vision was the so-called "Wright Act" of California enacted in 1887. Since that time irrigation district laws have been adopted in all of the states containing arid lands.

The fundamental features of these laws, from a financial standpoint, are the same: Funds are raised by the sale of bonds; interest, sinking funds, and cost of operation and maintenance are raised by assessments against the lands in the districts; the taxing machinery of the states is used to collect these assessments; and lands may be included in a district and made liable for the cost of providing a water supply against the will of their owners.

The original California law provided that "fifty or a majority of the freeholders owning lands susceptible of one mode of irrigation from a common source and by the same system of works," might petition for the organization of a district. All the electors in the area included were allowed to vote at district elections, without regard to land ownership. This made it possible for the owners of a small area of land to force district organization onto large areas against the opposition of their owners. This was held to be an advantage, since it prevented the owners of large tracts from holding their land out in opposition to the development of the community. However, it proved to be a weakness to the district system since it resulted in the inclusion in the districts of large areas whose owners were hostile to the purposes of the districts. While they could not prevent organization, they could resist the levying of taxes, the collection of taxes, and every other move, and thus hamper the opera-

tions to such an extent as to bring about the failure of the districts. Litigation involving the constitutionality of the law was carried to the United States Supreme Court, where the law was upheld;⁷ but most of the districts failed, nevertheless. From the passage of the California Act until 1896, when this decision was rendered, 48 districts were organized in California, and not one of these districts met its obligations in full. They sold some \$8,000,000 of bonds. Of the bonds to this amount 27% were held to be illegal, 8% were defaulted, and 65% were compromised with greater or less losses to the buyers.⁸

This particular phase of the California law was remedied by the act of 1897 which provided that the petition for the organization of an irrigation district must be signed by a majority of the landowners who represented a majority in value of the land to be included in the district. In seven states—California, Colorado, Montana, Nebraska, New Mexico, Texas, and Utah—those signing petitions for organization must represent a majority, either in acreage or assessed value of the land to be included in a proposed district. In seven of the states—California, Kansas, Idaho, New Mexico, Oregon, Texas, and Washington—more than a majority vote is required to carry the organization of a district. In five of the States—Idaho, Kansas, Nevada, Texas, and Utah—more than a majority vote is required to carry a bond issue. Three States—Arizona, Colorado, and Nebraska—require no more than a majority in favor of organization or bond issues at any stage.

The provisions just described have

⁷ *Fallbrook Irrigation District v. Bradley*, 164 U. S. 112, (1896).

⁸ Hutchins, Wells A., "Irrigation District Operation and Finance," United States Department of Agriculture, Bulletin No. 1177, 1921, p. 25.

nothing to do directly with the validity of bond issues, but they do affect the sale of bonds to careful investors, and, therefore, have an important bearing on the financing of irrigation enterprises, since they indicate to a certain degree the sentiment of the landowners toward the districts in which their lands are included.

Real Security of Irrigation Financing

The problem of making the lands security for the cost of their own reclamation is solved by the district laws. The lien on the lands is made effective by the levying of assessments and in most states the county officials are charged with making levies if the district officials fail or neglect to do so. These tax liens are enforced in the same manner as other taxes. The value of the security depends, therefore, on the value of the land at forced sale, and that depends, very largely, on the demand for land, since most land in the arid region is fertile, and on the adequacy of the water supply, since desert land without a water supply is worth little or nothing. Therefore, it is not sufficient that districts be legally organized and that they have the goodwill of the owners of the land included. In order that bonds issued may be safe investments, it is necessary that there be a sufficient water supply and an effective demand for the land. The unimproved land itself is not worth the cost of the works to bring water to it, and the real security of the bonds issued to secure funds for construction is the successful agricultural development of the lands. If the funds are wasted and the works are not completed, if the water supply is insufficient, if the lands are not settled and there is no demand for

them, or if, for any reason, settlers either do not come or cannot farm profitably, the bondholders will lose. For this reason the irrigation district law is not adapted to the reclamation of new lands and it has not been a success for such lands. A report published by the United States Department of Agriculture⁹ in 1923 gives statistics for all districts organized to that time. Of the 248 districts organized up to December 31, 1921, for the purpose of reclaiming new lands, only 46, or 18.5%, were operating at that time.

The principal field of usefulness for the district law has been in the purchase of works already built and in use by farmers already on the ground, and in providing additional works or water supply for such farmers. In such cases the farmers are there and the lands are partly improved and are worth the amount of the bonds issued, which serve only to add to the value of the lands. The report just referred to shows that of 350 districts organized for supplemental development, 198, or 56.5%, were in operation. Of all districts organized for both purposes, 41% were operating in 1921.

This is not an impressive showing, and it indicates clearly that the idea behind both the Carey Act and the district laws—that of tying the land and the water supply together and making the cost of reclamation a lien on the reclaimed lands—is not a complete solution of the problem of financing land reclamation.

Because of the failure of so many districts and of defaults in the payment of interest and principal on district bonds, the markets for such securities have not been good, and the states have

⁹ Hutchins, Wells A., *op. cit.*

made many attempts to make irrigation district bonds more attractive to investors by providing safeguards against frauds, mistakes, and overoptimism and by making district bonds legal investments for certain public funds and for certain classes of institutions. The steps in this direction that have been taken in the various states are summarized below.

Safeguards for Bondholders

In all of the states having irrigation district laws, the proceedings for district organization are before some public body, usually the board of county commissioners, or the equivalent body, if it goes by some other name, but in some instances before the local courts.

There is general provision for determining in the courts the validity of the proceedings for organization and the issuance of bonds.

There is rather general provision for reports by state officials on the water supply and engineering features of proposed projects. Usually these reports are advisory, and adverse reports are not conclusive against organization, although they tend to be so in practice because of the difficulty in selling bonds in the face of adverse reports.

The next step in public action designed to give the bonds a standing in public opinion, and therefore a good market, is state certification of district bonds as legal investments for certain public and trust funds. California in 1913 created an irrigation district bond commission and provided for the certification of bonds by the state comptroller under certain conditions. Any district proposing to issue bonds may apply to have its bonds certified. Upon the receipt of such an application the

commissioners examine (1) the water supply, (2) the soil and its probable water requirements, (3) the feasibility of the plans for supplying water, (4) the reasonable market value of the water, water rights, and irrigation works of the district, (5) the reasonable market value of the land in the district, (6) whether the proposed bond issue, together with others that have been issued or proposed, exceeds 60% of the value of the water, water rights, works, and land, (7) the character and number of bonds proposed to be issued.

The commission reports to the state comptroller, and if it reports that the water supply is sufficient, that the plans are feasible, and that the proposed bond issue does not exceed 60% of the value of the water, water rights, works and land, the bonds are certified by the comptroller.

Bonds so certified are legal investments for "all trust funds, for the funds of all insurance companies, banks—both commercial and savings—and trust companies, and for the state school funds, and whenever any money or funds may, by law now or hereafter enacted, be invested in bonds of cities, cities and counties, counties, school districts, or municipalities in the state of California, such money or funds may be invested in said bonds of irrigation districts."

This idea was adopted by Colorado, Idaho, Montana, Nevada, Oregon, and Utah, although Utah later repealed its law.

The provisions of the Idaho law differ from those of California law in that the commission is, (1) to determine the reasonable "cost" of the water, water rights, and works belonging to the district, rather than their "value"; (2) to determine the value of the land

in the district "when supplied with the water that will be made available"; and (3) to determine whether the aggregate amount of bonds proposed exceeds 50% of the reasonable value of the "lands within the district with the water that will be available." The essential differences seem to be that California takes into account the value of the water, water rights, and irrigation works, while Idaho does not; but, on the other hand, Idaho takes into consideration the prospective value of the land on account of irrigation, while California takes the value of the land as it stands. Idaho requires a margin of value above bond issues of 50%, while California requires only 40%. In Idaho, bonds are certified by the state treasurer and are then legal investments for the same classes of funds as in California.

Oregon has gone a short step further in assuming actual financial responsibility for district bond issues by providing for payment by the state of interest on approved bonds for from two to five years, with provision for repayment to the state by the districts after their bonds are paid off.

Washington has provision for state purchase and resale of district bonds. This does not involve the state guaranty of the bonds sold by the state except as there may be a moral obligation to make them good.

Under the Carey Act and the district acts the states have made every effort to give reclamation bonds a good standing except assume some financial responsibility—and Oregon has gone so far as to pay interest on district bonds for a limited period.

The Federal Government has given its approval to the district plan by providing for the inclusion of public lands

in irrigation districts and permitting the levying of assessments against such lands (Act of August 16, 1916), but with the very important reservation that "nothing in this act shall be construed as creating any obligation against the United States to pay any of said charges, assessments or debts incurred." The accumulated charges are to be paid by the entrymen on the public lands, if there are such entrymen. Until some one applies for land, there is no way of making it liable for its share of the cost of providing a water supply.

Proposals for Remedying Weaknesses of District Plan

The inherent weakness of the district plan—that the desert lands are not sufficient security for the cost of their own reclamation—is recognized in proposals that have been made for federal aid to reclamation outside the reclamation act. It has been proposed that lands to be reclaimed be organized into districts which shall enter into contracts with the government under which the government shall advance the funds for construction, carry out the work, and accept the bonds of the district in payment. Furthermore, the government shall hold the bonds of each district until the value of the land and other property of the district against which the bonds are a lien shall be sufficient to make the bonds salable, when they shall be sold and the funds made available for further construction. It is also proposed that the district bonds shall bear interest, thus doing away with the subsidy feature of the existing Federal reclamation law.

The suggestion has also been made to include drainage of swamps, clearing of cut-over lands, and fertilization of

worn-out lands in the scheme. While the bonds are being held, admittedly the government will have insufficient security for its expenditures.

A proposal somewhat similar to the scheme just described, and probably suggested by it, is the creation of a reclamation corporation, financed, as are the Federal land banks, by the sale of bonds based on securities that are liens on the lands. This plan has the same objection that has been made to districts generally—the lands actually are not sufficient security for the cost of their reclamation. There is also this very important distinction between the working of the Federal land bank system and the proposed scheme: The bonds sold to obtain funds for the land banks are based on mortgages that may not exceed 50% of conservative appraisals of the value of the property covered by the mortgages, while irrigation district bonds are based on lands having a value far below the amount of the bonds issued for their reclamation. The value that is to make the bonds good is to be created by the expenditure of the proceeds of the bond sales. The published report on one of the proposed projects of the Federal Government gives the present value of the land to be reclaimed as about \$5 an acre, while the estimated cost of its reclamation is more than \$150 an acre.¹⁰ That is, the present value of the security in this project is about 3% of the amount of bonds that would have to be issued under the plan suggested.

If the bonds are to be sold by a corporation created by the Federal Government for sufficient sums to build

reclamation works, they must depend for their salability on a government guaranty or an implied guaranty that would create a moral obligation on the government to make them good.

Up to the present time all our schemes for financing irrigation development have been based on the repayment of the cost of providing a water supply by the land actually watered, except for the subsidy represented by relief from interest on deferred payments under the existing Federal reclamation law. Yet the argument for all public participation in reclamation is the claim that a great public benefit arises from the reclamation of arid lands. If such is the case, the question arises whether the water users should be expected to repay the whole cost. Should not the benefits be assessed and all property benefited contribute to the cost in proportion to the benefits?

The most insistent demands for new reclamation projects come from local chambers of commerce and similar organizations, because of the business that is expected to be created through the construction of works and the development of agriculture in their communities. The demand does not come from farmers who wish to go on the land. If a reclamation project is of so much value to the business interests of a community, it would seem fair that those interests should contribute to the cost.

Such contributions can be provided for under some modification of the district plan, by including within each district all the property that will be benefited by its activities, including the property in towns and cities in the vicinity. If such property were included in the district bond lien, there would be sufficient value behind the bonds to make them salable.

¹⁰ *Reports on the Engineering, Agricultural, and Economic Feasibility of Proposed Reclamation Projects*, Washington, Government Printing Office, 1925, p. 85.

Such a scheme should provide for the approval of districts by the counties and states in which they are located and for contributions from the counties and states in proportion to the public benefits.

This would place reclamation enterprises in much the same class as public utilities generally, and they might be operated in the manner common to community-owned public utilities—by charging rates for the service rendered

and meeting payments on indebtedness and operating expenses from general property taxes in case the revenue from rates is not sufficient for this purpose. It would be necessary to base rates on what the traffic can bear rather than on a reasonable return on the investment, but this may be justified on the ground of public benefit. In the opinion of the writer this is the most probable line of development in reclamation finance, aside from government enterprises.

THE DEVELOPMENT OF PUBLIC LAND POLICY IN AUSTRALIA¹

By WILLIAM H. WYNNE

THE colonization of Australia began in 1788 with the landing of a thousand souls on an unexplored territory close to where now stands Sydney. Of these, one-third were marines, and the remainder convicts for whom, after the Revolution, there was no longer an outlet in America.

During the first few years little progress was made toward rendering the penal colony self-supporting. The task of clearing the land was arduous, and the work of preparing the seed-bed not less laborious, for hoes and spades—and those of poor quality—were the only farm implements available. The convict laborers took little interest in these operations and proved extremely inefficient. Marines as well as prisoners were drawn mainly from large towns, and there was indeed hardly a man in the settlement who had any practical knowledge of agriculture. To make matters worse, drought was prevalent. As a consequence, on more than one occasion, when supplies from England were belated, the colony was on the point of famine, and doubts were freely expressed in England as to whether it was worth keeping.

The discovery that the colony was admirably adapted for the raising of merino sheep dispelled these gloomy fears. After long negotiations and

wearisome delays, Captain Macarthur, an officer of the garrison, obtained from the Imperial Government a grant of 5,000 acres in New South Wales upon which to conduct sheep-raising experiments—with the promise, if they proved satisfactory, of an additional 5,000 acres. He succeeded beyond all official expectations, and before many years had passed, the mother country was crying aloud for more and more colonial wool.

The Free Grant System

From the beginning it had been the practice of successive governors, in accordance with their instructions, to allot small grants of land to marines and discharged convicts who wished to become settlers. Such a policy ceased to be adequate when the pastoral possibilities of the colony were revealed, and it was then seen to be essential to attract able and well-to-do men to the colony and to allot them large tracts of land as pasturage for their stock. Accordingly, during the next few years, several grants of land, varying in size from 1,000 to 8,000 acres, were made to suitable English emigrants. After 1810, intending settlers were merely furnished by the Home Government with an Order directing the governor of the colony to grant them a holding proportionate in area to the capital they had available for investment in the colony, the precise amount to be allotted being thus left to his discretion. For

¹This is the first of two articles, summarizing an extensive piece of research (written between 1922 and 1924 and based on first-hand documentary sources of information) which the author hopes to be able to publish shortly in book form.

some years the governor established no uniform rule as a basis for the allocation of grants, but in 1821 he found it necessary to do so, for in that year the influx of settlers began to be much heavier than before. According to the scale drawn up, the maximum grant obtainable by any settler, whatever his capital, was set at 2,000 acres. But stock increased rapidly, and as even 2,000 acres sufficed to graze only about 200 head of cattle or 600 sheep, it was not long before many settlers found that their holdings were more or less inadequate.

To meet this situation, regulations were drawn up in 1823 providing for the sale of land, and from that year until 1831 the free grant system and the sale policy were maintained side by side. During these eight years, however, the total area of land sold in New South Wales amounted to only 13,672 acres. The explanation of this somewhat surprising fact is a threefold one. In the first place, any settler who could obtain a free grant naturally preferred to do so rather than to buy land at 5s. or more an acre, for although the grant was subject to a small quit-rent, it was notorious that this rent was seldom collected and that little or no attempt was made to enforce payment. Secondly, settlers who found their holdings too small simply pastured their stock on unalienated land, thus giving rise to the great squatting problem—to be discussed later—which forms the central feature of Australian land history. Finally, the Home Government itself did much to defeat the sale policy, for while the colonial governors rarely gave a grant larger than the stipulated maximum of 2,560 acres,² the former made, between 1822 and 1830, several

grants considerably in excess of this area. Various individuals were assigned holdings ranging from 10,000 to 15,000 acres, while, overshadowing all, a huge grant of 1,000,000 acres was bestowed on the Australian Agricultural Company, a company formed in England by many prominent persons for the development of the pastoral industry in New South Wales.

Such rapid strides did the sheep industry make that by 1833 the annual exports of wool exceeded 1,700,000 lbs. Meanwhile, although the population had reached 60,794, and over 4,000,000 acres of land had been alienated, only 60,520 acres had been brought under cultivation. The reasons for the backwardness of agriculture are not far to seek. The labor question presented the first difficulty. To make tillage possible the land had to be cleared, and even after this was done, farming on a given scale required many more workers than comparable stock-raising operations. Convicts were practically the only available laborers; these were parceled out among free settlers as "assigned servants," but as immigration increased, the supply of convict labor became too short to permit of extensive cropping; and while "government men" proved most inefficient as agriculturists, they made fair shepherds. Furthermore, although grantees were required, under penalty of forfeiture, to cultivate a certain proportion of their land, the administration was too weak to enforce this obligation, and indeed made practically no attempt to do so. The primary cause, though, of the slow progress of agriculture was the fact that it offered no prospect of gain comparable with the returns obtainable from wool-growing. Farm produce was salable only in an extremely restricted local market, while

²The maximum was raised from 2,000 to 2,560 acres in 1826.

for wool there was an unlimited demand, at good prices, in England.

The Wakefield Theory

In 1831 the free grant system was abolished, and sale by auction at a minimum price of 5s. an acre was instituted as the sole method of land alienation. In making this change the British authorities were influenced by the theories of that eager and imaginative colonial reformer, Edward Gibbon Wakefield, and at this point a brief exposition of his views becomes necessary. Pointing to the slow growth of settlement in Australia and other British colonies, Wakefield declared that this was directly attributable to the free land policy. The one means, he believed, by which more rapid progress could be ensured, was to reproduce in the colonies the capitalistic methods of agriculture which obtained in England. But while any colonist could easily become a small landowner, few would work as hired laborers; and in the absence of an efficient labor supply, capitalists knew it was hopeless to enter agricultural pursuits. The remedy was patent, argued Wakefield; no more free grants should be given, and a price should be put upon all Crown land, high enough to make it impossible for a settler without means to obtain land until he had worked and saved as a hired man for a few years. The proceeds should then be used to provide assisted passages for selected immigrants from England. With a permanent labor supply thus assured, capitalists would be attracted, and rapid agricultural development and close settlement would follow.

The new land policy gave cold comfort to Wakefield. He regarded a price of 5s. an acre not as an adoption of his

policy, but "as just such a colorable adoption of it as to bring it into discredit."³ He continued through a dozen channels of propaganda to disseminate his ideas, insisting primarily on the need for establishing what he called a "sufficient" price, but just how high in the case of any particular colony this price should be, he could never be induced to say.

The Application of the Theory in the Founding of South Australia

In 1836 practical effect was given to Wakefield's theory by the founding of a model colony—South Australia. Land was sold at £1 an acre, and emigration was financed by the proceeds on such a scale that in four years the population exceeded 15,000. But the bulk of the settlers remained in the townsite, Adelaide, and engaged in feverish speculation in town lots. Meanwhile famine was stayed off by food supplies drawn from New South Wales, and gainful employment was provided for those who had no means by an extensive system of public works financed by loans raised in England. For a time all went merrily; but in 1840 the credit of the colony fell to zero, the land bubble burst, and only financial aid from the British Government saved the colony from ruin. Sadder and wiser, the colonists then turned to agriculture, though on a small scale, and by rigid retrenchment the colony was soon placed on its feet again.

The misfortunes of these early years are attributable in the main to defective organization, lack of preparation for receiving a large army of immigrants, and maladministration after

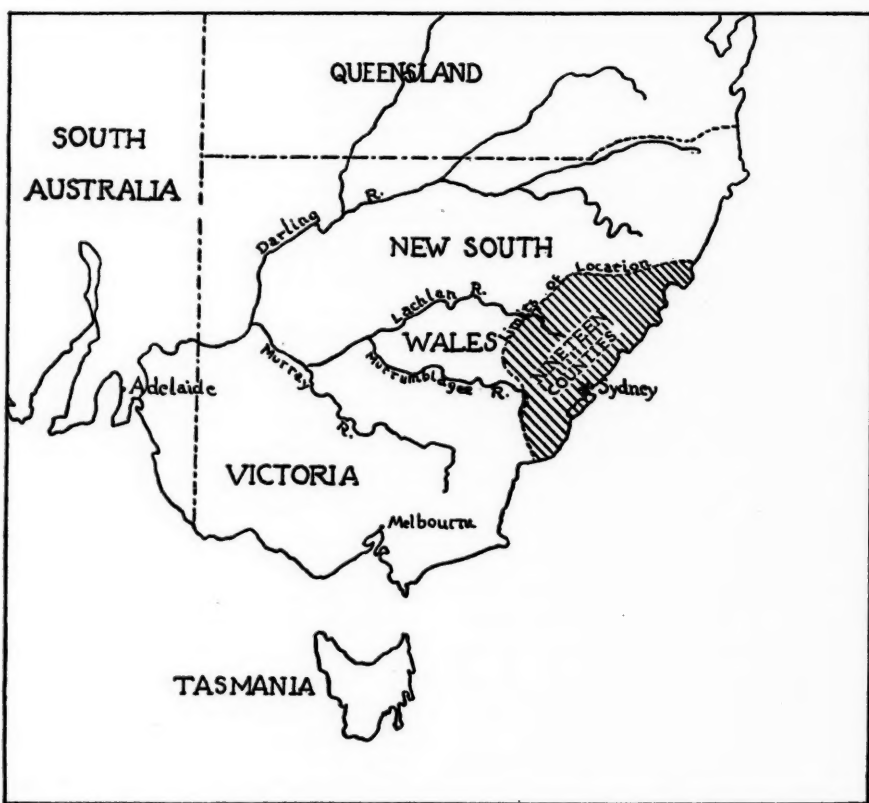
³ Evidence before the "Select Committee on Waste Lands" (reply to question 731); *Parliamentary Papers*, 1836, Vol. XI.

they arrived, rather than to inherent defects in Wakefield's theories. Wakefield himself, it must be noted, took no active part in the practical conduct of the experiment. The experience of South Australia did reveal, however, at least one weak link in his chain of argument. "Nothing," he wrote, "would show more plainly to what extent the demand for labor had increased half so distinctly as the amount of land sold." He appears

hardly to have realized that land might be bought as a speculation, for purposes of resale and not for cultivation. Yet in fairness it must be added that had the enterprise been more competently managed, speculation would never have assumed the proportions it did. All of the arrangements for the sale of land in England were such as to give a great stimulus to jobbing. The colony was puffed and lauded by all the arts of the land-agent—by enchanting pictures,

SKETCH MAP OF SOUTH-EAST AUSTRALIA

Showing the Location of the Original 19 Counties



highly imaginative pamphlets, and exaggerating prospectuses. Very little land had been surveyed for settlement by the time the first shipload of settlers arrived, and the progress of the surveys continued to be slow. This circumstance tended to concentrate settlers in the town and thereby to intensify speculation.

The Wakefield System in New South Wales

In 1839, due largely to Wakefield's influence, the British Government raised the price of land in New South Wales to 12s. an acre, and in 1842 made a further increase to £1 an acre. Between 1832 and 1848, under this sale policy, over 2,000,000 acres of land were sold in New South Wales, and the proceeds used to assist an army of British emigrants to reach Australia. These immigrants in time swamped the convict element, played a large part in forcing the mother country to abolish the hideous transportation system, and hastened the advent of responsible self-government. State-aided emigration, which, curiously, Wakefield regarded as the least essential part of his scheme, proved in fact the one element of permanent value in it. But the policy of land sales gave little impetus to agriculture, for in these 16 years only 100,000 acres of additional land were brought under cultivation, while exports of wool increased by leaps and bounds and flocks multiplied so rapidly that by 1848 the sheep in the colony numbered over 11,500,000. Wakefield's doctrine worked out indeed

quite otherwise than he anticipated. Capitalists turned, not to farming, but to the easier, freer, and more profitable pursuit of sheep-raising, while most of the immigrants whose passages were financed out of the proceeds of land sales became shepherds or town workers, not agricultural laborers. Agriculture remained the occupation of the small settler who, "with his family, supplied most of the labor that his holding required."⁴

The Rise of the Squatter⁵

The most significant aspect of land settlement in New South Wales in 1848, however, was not that over 6,000,000 acres of land had been alienated, but that 180,000,000 acres of Crown land were occupied for pastoral purposes. We must now retrace our steps and examine the many difficult problems of land policy with which in the course of this remarkable pastoral development the government had been confronted.

For a quarter of a century after the founding of New South Wales, settlers were hemmed in by the Blue Mountains, a wide, plateau-like range which traverses the state⁶ from north to south, forming a coastal region with an average width of less than 50 miles. The land in this region was mainly forest, in general sufficiently open to provide pasturage, but in parts densely wooded, while the alluvial valleys were subject to occasional floods. As sheep and cattle multiplied, the need for further dry and open pastures became urgent. Several unsuccessful attempts

⁴Coghlan, Sir T., *Labor and Industry in Australia*, Vol. I, p. 506.

⁵Originally the term "squatter" had in Australia the connotation it has in America, but in time it came to be used merely as a synonym for "pas-

toralist," in which sense it is here employed.

⁶When, on January 1, 1901, the federated Commonwealth of Australia was established, the designation of the six member "colonies" was changed to that of "states."

were made to pierce the mountain barrier, but not until 1813 was victory achieved. The day when the proud explorers burst through the pass and looked out upon the illimitable grassy plains stretching westward beyond the horizon was a momentous one for Australia, for there lay a new Canaan, with the promise of pastoral wealth untold.

Yet the joy of the governor and his officials was tempered with misgiving, for the wider the area over which settlement spread the more difficult became the problem of administration, while the path that now lay open to the stockman might equally afford an avenue of escape to the felon. Macquarie, the governor, curtly announced that pending the arrival of instructions from England he would grant not an acre beyond the mountains, and warned settlers that they would not even be allowed to visit the newly discovered territory without a written pass from him. But the land-hungry pastoralist was too impatient to await either the deliberations of the Colonial Office or the gubernatorial sanction, and soon an army of scraggy sheep was streaming through the pass.

Bowing to the inevitable, Macquarie next endeavored to control the situation in some degree by issuing to approved persons "tickets of occupation," entitling them to graze their flocks where they wished. No rent was demanded, and these "tickets" were little more than certificates of character designed to keep ex-convicts of doubtful reputation under the eyes of the authorities. In 1826 the free grazing policy, together with the issue of "tickets of occupation," was abandoned, and, in its stead, pasturage was offered on a yearly lease at the rate of £1 per 100 acres.

In 1829, in accordance with instruc-

tions from England, the land comprised within the existing frontiers of settlement—about 24,000,000 acres—was subdivided into 19 counties; this area thereupon became officially known as the "settled districts," the outer districts being termed "unsettled." The dividing line was aptly designated the "limits of location," for beyond it the government refused either to rent, grant, or even—after the abolition of free grants in 1831—to sell land.

Macquarie had found it impossible to hold a gap in the mountains against the pressure of the eager pioneer; it was futile to hope that the tide of settlement could be dammed behind a mere arbitrary boundary across a plain. North, south, and west, the explorer discovered new, rich, grazing country, and everywhere the sturdy squatter followed close in his wake.

Not until 1836 were the first steps taken to systematize this phase of settlement. In that year regulations were framed providing that for a yearly fee of £10 a settler might obtain a license entitling him to graze stock outside the limits. But the licensee was warned that any improvements he effected on the land he occupied would be at his own risk, for the Crown reserved the right to resume possession at any time without offering any compensation.

Steadily the pastoralist advanced inland, and by 1843 the population beyond the boundaries numbered 10,000, while 390,000 cattle and horses and over 3,000,000 sheep were pastured there—or nearly two-thirds of the live stock in the colony. Liable as they were to dispossession at the will of the Crown without compensation, squatters hesitated to erect any extensive improvements on their runs, or to establish settled and comfortable homes. But as they grew in wealth and numbers

they began to agitate for a more satisfactory tenure. Their demands were threefold: a preemptive right to purchase the land on which they had made their permanent improvements; compensation for the value of these improvements if the land on which they stood was sold or the land let to another; and, lastly, in place of a precarious annual license, an indefeasible lease for a term of 21 years.

The Squatters' Struggle for Their Claims

The squatters fought tenaciously and bitterly to gain their ends. It is possible here merely to indicate the chief phases of the struggle, but the full record constitutes one of the most important and vivid chapters in the political history of Australia. The brunt of the battle fell upon the governor, Sir George Gipps, for reasons it is necessary briefly to explain. Prior to 1842 changes in the land regulations of the Australian colonies were made at the direction of the Colonial Office, and it was at the mere *ipse dixit* of a Secretary of State that free grants were abolished and the price of land set first at 5s. an acre and raised later to 12s. This backstairs policy was vigorously condemned in England by Wakefield and his disciples, and through their influence colonial land questions were brought into the open arena of parliamentary debate. As a result, in 1842, an Act was passed (the Imperial Waste Lands Act), applicable to South Australia as well as to the older colonies, which for the first time placed their land system on a statutory basis. This act provided that all Crown land for sale should be put up for auction and that the maximum upset price should be £1 an acre; but

the enactment left untouched the great squatting problem, for it contained no provisions respecting the occupation, as distinct from the sale, of land, other than one throwing upon the governor the burden of framing suitable regulations.

The powers left to the governor were exceedingly onerous, for by this time New South Wales had a Legislature two-thirds elective, and although the control of land policy was withheld from this body, yet any action the governor might take in land matters in opposition to its wishes could easily be given the color of direct antagonism to the democratic aspirations of the colonists. Gipps urged the Home Government to take the matter out of his hands, but meanwhile he was not the man to shrink from his responsibilities. He realized clearly that the pastoral industry was by far the most important in the colony, and he was anxious to afford it every encouragement; but at the same time he was determined to do nothing to jeopardize the Crown's right of ownership over the vast grazing areas which might in time prove suitable for more intensive settlement. Accordingly he opposed the grant of long leases, for if the squatting element continued to be the most powerful in the Legislature, there was danger, he feared, that before the 21-year leases expired they would be converted into freeholds.

In 1844 the governor made his first concession. Regulations were published offering every squatter an opportunity to purchase at auction 320 acres of his run for a homestead, with a guaranty to the purchaser that his grazing license would be renewed annually for a period of 8 years. The purchaser of the homestead, whoever he might be, was to have the right to the run, but

the squatter, if outbid, was to be compensated for his improvements. Gipps realized the unsatisfactory nature of the auction provision, and favored the granting to the runholder of a preemptive right to purchase a homestead, but the governor had no power to confer any such privilege until the Imperial Land Act of 1842 had been amended to permit sale by preemption.

Realizing that the ultimate disposition of their claims rested with the British Parliament, the squatters, without ceasing their pressure upon the governor, extended their campaign to England. They sent deputations to cabinet ministers, enlisted the active support of prominent merchants and bankers, and engaged a member of the House of Commons as their spokesman in the Legislature. For two years they worked and lobbied, and then success came. By the Australian Waste Lands Act of 1846, supplemented in the following year by Orders-in-Council, New South Wales was divided into three districts, termed "settled," "intermediate," and "unsettled," respectively. The first comprised the 20 counties (one had been added to the original 19), land within 3 miles of the sea and 2 miles of certain rivers, and belts of land around the main towns varying from 10 to 15 miles in width. An area about twice as large was embraced in the intermediate districts, while the remaining inland region constituted the unsettled districts. In the settled districts leases were granted for only 1 year, in the intermediate for a term of 8 years, and in the unsettled for 14 years. The squatters had good cause to be satisfied with this measure, for though they obtained leases for only 8 to 14 years instead of for 21 years, they acquired the right of preemption and of compensation for improvements, not only

over a homestead area, but over the whole of their runs. The security of tenure thus gained encouraged them to improve their holdings by fencing, by building better houses and woolsheds, by breeding better stock, and by digging wells and dams, while the long lease and right of preemption added substantially to the value of a run.

To What Extent Did the Legislation of 1846-1847 Check the Progress of Settlement?

But the squatters were not long left to enjoy their victory in peace, for in 1851 the discovery of gold brought an army of adventurers to Australia and forced new land problems sharply to the front. A year previous, the southern portion of New South Wales had been made a separate colony—Victoria—and during the ensuing decade population in both mother and daughter colony, especially the latter, grew rapidly, as Table I shows.

A few months, or even weeks, sufficed to convince many of the gold seekers that the game was not worth the candle; moreover, by 1855 surface mining had largely given way to deep mining by commercial companies. Almost from the outset of the gold discoveries there was, in consequence, a steady stream of men turning from the diggings to seek other occupations. Among those

TABLE I. POPULATION GROWTH OF VICTORIA AND NEW SOUTH WALES, 1851-1861*

Year	Victoria	New South Wales
1851	77,000	191,000
1855	347,000	266,000
1861	539,000	351,000

*Population to the nearest thousand.

who had accumulated a little money or retained part of the capital they may have brought to the colonies, there were many who wished to settle on the land. The supply of Crown land in the market suitable for small holders was, however, insufficient to meet the demand, and the cry arose that by the Act of 1846 and the Orders-in-Council the British Government had surrendered the land for 14 years into the grip of a handful of squatters, thereby blocking the progress of settlement.

The opinion is fairly generally held that the leases conferred under the Imperial Act were a serious barrier to closer settlement, but analysis shows that this view is largely untenable. In New South Wales the land allotted under 14-year leases was well in the interior, where drought precluded any extensive cultivation; the intermediate districts, it is true, contain an abundance of good farm land, but there only 8-year leases were granted, and, owing to the complete absence of railways, there was little likelihood that much agricultural development would be practicable before the leases expired. The absolute right of preemption proved a more formidable obstacle to settlement than the leases. For, although the government reserved the right to put up for auction at the end of each year any portion of a run, the leaseholder could exercise his preemptive right to purchase such lots at the price of £1 an acre, and indeed squatters used this right freely to buy up some of the choicest parts of their holdings. In the settled districts land was barred to settlers neither by leases nor preemptive rights, but there the mainspring of the trouble was the inability of an understaffed Survey Department to measure land and put it up for sale fast enough

to meet the demand. Progress was the slower because the coastal region is rough and broken, and unalienated land suitable for small holdings lay only in patches scattered here and there.

In Victoria, the Orders-in-Council threatened to prove more injurious to settlement. The 31,000,000 acres which in 1851 were held under license were much nearer the coast than the great pastoral areas of New South Wales, and included much land capable even at this time of being easily and profitably cultivated. Moreover, as the growth of population had been much greater in Victoria—due to the fact that the main goldfields were situated there—the demand for land was naturally much keener than in the older colony. Latrobe, the lieutenant-governor of Victoria, set out resolutely to minimize the evils he foresaw. Before formal leases could be issued, it was necessary to survey the boundaries of runs. By making the most of the scarcity of surveyors—a scarcity more acute even than in New South Wales—and by taking advantage of other means of delay, Latrobe was able to put off the granting of leases, and, at the same time, despite loud outcries from the squatters, to set aside nearly 1,000,000 acres of good land as reserves for settlement needs in the near future. His position was considerably strengthened by the approval of the Home authorities—to whom he referred the whole problem—with the result that the Orders were never put into operation, and, instead of leases, the squatters were merely given as before annual licenses which were renewed each year. Meanwhile they were allowed only a very limited right of preemption, and as much land as possible was brought into the market. After Latrobe resigned (in 1854) this policy was

adhered to by his successor, and in 1861, the year in which the full term of 14 years contemplated by the Orders expired, the squatters still held their runs on annual licenses, and waited for leases which had never been issued.

The Reaction against the Squatters

The Waste Lands Occupation Act of 1846 and the Orders-in-Council mark a watershed in the development of Australian land policy, for they constituted the final attempt of the Imperial Government to frame land laws for the Australian colonies. In 1855 the colonies were granted responsible self-government, and with it the right to reshape their land policy as they wished.

The most pressing economic problem facing the newly aggrandized governments in Victoria and New South Wales was how to help men who wished to establish themselves on small holdings. Loudly colonists proclaimed that the squatters blocked the path, monopolizing the best lands and holding as sheep runs the ample appanage which might otherwise be dotted with smiling homesteads. Prominent among the malcontents were many educated men of radical views—chartists from England, and refugees from the revolution-swept continent—who had come to Australia in the gold rush. These denounced the territorial magnates on the platform and in the press, and demanded that the government should unlock the lands for settlement.

Despite the wide-spread cry for legislation to facilitate the settlement of small holders, many years elapsed before a new land act was passed. The party spirit was so weak in the legislative assemblies, and the variety of opinions so great, that land bill after

land bill was rejected and ministry after ministry overthrown.

In giving evidence before a select committee of the Legislative Council of New South Wales in 1855, John Robertson (afterwards Sir John), a prominent and old established settler, maintained that a great deal of the land held under pastoral lease was suitable for agriculture; and the solution to the land problem and the remedy for the backwardness of agriculture lay, he declared, in free selection before survey and the sale of land on easy credit terms. If only settlement were facilitated by these means, a class of small yeoman farmers would spring up, he believed, and agriculture would flourish. The cry of "free selection before survey" was taken up and became the slogan of advanced land reformers in Victoria as well as in New South Wales.

But no free selection measure was likely to be passed by a legislature in which the squatters held the balance of power. Hence, after a long struggle a new electoral law was passed in New South Wales, extending the franchise, and increasing and redistributing seats in such a way as to increase materially the political representation of the towns. This done, and an election fought and won on the issue of "free selection before survey," Robertson, who had become Minister for Lands, succeeded, in 1861, in piloting through to the statute book of New South Wales two measures embodying his policy.

The first of these—the Crown Lands Occupation Act—provided that pastoral leases should be renewable at their expiration, not for 8 or 14 years, but only for 5, and, in addition, curtailed the right of preemption to a minimum.

The second—the Crown Lands Alienation Act—provided that after January 1, 1862, any person might select from 40 to 320 acres of Crown land—surveyed or unsurveyed—and acquire it as a homestead by paying £1 an acre over a period of 3 years, provided that he resided on it during that time and made improvements to the amount of the purchase price.

The new land policy still permitted sale by auction, but for land purchased in any other manner than by conditional selection, payment in cash was required.

Free Selection Policy in Operation

The Robertson Acts were amended in certain respects in 1875, and again in 1880, but it was not until 1884 that they were repealed and new legislation introduced. During the 23 years the acts were in operation, over 23,000,000 acres were sold conditionally—of which 6,000,000 acres, through cancelation or forfeiture, reverted to the state—and nearly 16,000,000 acres by direct sale. This enormous alienation of land, totaling 33,000,000 acres, or nearly five times the total area of land alienated prior to 1861, was accompanied by an addition to the arable acreage of the colony of only 550,000 acres—an area equivalent to only about one-sixtieth of the land sold. It is clear, therefore, that the Free Selection Act did little if anything to stimulate the progress of agriculture. Meanwhile, the sheep in the colony multiplied fivefold, and in 1884 the colony appeared even more definitely pastoral in character than in 1862.

But though Robertson's Alienation Act failed to achieve one of the fundamental aims of its promoter, it undoubtedly made it easy for people who wished to do so to obtain access

to the land. To what extent, then, was a class of small holders, engaged in either pastoral or agricultural pursuits, established?

The Robertson Act threw open to selection practically the whole of the unalienated land of the colony, including land held under lease. But the men who had fought for years to acquire some security of tenure, and then, by the erection of good buildings, by fencing, and by the digging of wells and dams, had considerably enhanced the value of their runs, soon showed that they were not prepared to surrender lightly the choicest parts of their holdings to invading selectors. The field was set for a clash of interests, and for many years the colony was plunged into a species of agrarian warfare. The squatter had to fight, not only the *bona-fide* selector, but also those unscrupulous persons who before long began to take up, as a conditional purchase, land containing watering places, or land close to the cattle camp of a station, with the sole object of compelling the squatter to buy them off. The only means by which the squatters could protect themselves was to forestall the selector by acquiring the freehold of strategic points on their runs. Accommodated liberally by the banks, they bought large quantities of land—some by virtue of their remaining preemptive rights, and some through the use of Volunteer Land Orders.⁷ But the bulk of the squatters' purchases were made in the auction room. In all probability the government which passed the Act of 1861 never intended that large areas

⁷ By the Volunteer Act of 1867 every member of the Defence Force became entitled after 5 years' service to one of these Orders, exchangeable for the freehold of 50 acres of Crown land; subsequently these Orders were made freely transferable.

of land should be sold by auction, this being retained merely as a subordinate method of sale which would prove advantageous to new settlers who possessed some capital. However, the vigorous policy of railway extension and public works upon which, about 1872, the government embarked, necessitated an increase in the revenue, and the short-sighted ministries of the day, anxious primarily to fill the Treasury, made no attempt to check the alienation of the public domain. The squatters met with little competition at the sales, for few other colonists were prepared to buy for cash, and they themselves maintained either tacit or open agreements to refrain from competitive bidding.

To circumvent the selector, the runholder resorted also to other devices, less legitimate than open purchase. Of these, vicarious selection, or "dummying," as it was termed, was the chief. The dummies were usually overseers, shepherds, or other servants, who took up selections on their employer's run, ostensibly for themselves but actually with the intention of transferring them at the earliest possible moment to the squatter. Dummying, though, was a two-edged weapon, and, occasionally, selectors who had obtained a footing on the land wielded it with success to accumulate larger holdings for themselves.

In large measure, however, this practice was the consequence of lax administration rather than of the defects of the act itself. During the first few years the law was in operation, no special officers were appointed to see that the selector resided upon and improved his holding, a solemn declaration by the latter that he had duly performed the duties required of him being accepted as satisfactory evidence.

Wide-spread perjury was the inevitable result; and although in time inspectors were appointed, they were too few in number to be able to report on each case, and dummying and false declarations still continued.

In 1883 two commissioners were appointed to investigate the working of the act. Their report⁸ showed that although to the end of 1882, 170,000 selections had been taken up—of which 40,000 had for one reason or another become invalid—less than 20,000 were at that date occupied as homesteads by resident selectors. Thus the establishment of less than a thousand homesteads a year was the net result of a policy designed to settle a flourishing yeomanry on the soil, a result which, considered in relation to the growth of population,⁹ afforded as little ground for satisfaction as the correspondingly small progress in cultivation. The act did indeed enable the genuine homeseeker to obtain a holding, but, all things considered, this advantage was conferred on him at too great a cost to the state. Prior to 1861 there were few large freehold estates. By 1882 there had been built up 193, each over 20,000 acres in area, including 13 mammoth holdings ranging in size from 100,000 to 300,000 acres. The latter were located mainly in Riverina—a region in the intermediate district, whose wheat-growing possibilities were soon to be realized—and had all been formed subsequent to 1861. During the quarter-century the Robertson Act was in operation, the tenure under which a large proportion of the occupied land in the eastern half of

⁸ See *Votes and Proceedings* of the Legislative Assembly of New South Wales, 1883, Vol. II.

⁹ The population of New South Wales was: At the beginning of 1862, 358,000, at the beginning of 1883, 811,000.

New South Wales was held was changed from leasehold to freehold. Thus, in that district at any rate, the squatter ceased to be a mere pastoral lessee of the Crown, and became a great private landowner. This aggregation of huge freehold estates was the most momentous outcome of the agrarian conflict.

The free-selection-before-survey policy was adopted by Queensland and Victoria also, but in neither of them were its consequences so harmful as in New South Wales. In Queensland an endeavor was made to avert a conflict by giving squatters a secure tenure of part of their runs to the exclusion of selectors. In Victoria practically the whole colony was indeed thrown open to selection, but the sharp restriction of preemption rights and the limitation of auction sales to 200,000 acres a year prevented the wholesale purchase of land by squatters, while more effective administrative safeguards were established to combat dummying and other notorious abuses. Despite the stringent conditions which selectors were required to fulfil, large areas of land were taken up by them, and they made steady progress in agriculture. But geographical conditions were in their favor. A great part of Victoria possessed a soil and climate suitable for agriculture, while selectors had comparatively easy access, by road or rail, to Melbourne, the chief market for their produce.

The Moral of the Tale

From the very beginning of Robertson's policy, far-sighted men had

predicted its probable consequences, and had urged that instead of throwing open for conditional purchase land which was simultaneously held under lease, areas fitted in respect to situation, soil, and climate for agricultural development should be withdrawn from lease, and selection confined to them. But Robertson and his colleagues contended that the dangers of indiscriminate free selection were much less to be feared than the partiality the government might exercise if it were required to select from areas already occupied by squatters land suitable for settlement by small holders. For indulging these nice scruples the country paid a heavy price.

The Agrarian Act of 1861 had this serious defect in common with the Wakefield system which it displaced—it provided that anywhere throughout the length and breadth of a colony with so varied a soil and climate as New South Wales land might be alienated upon the same terms and conditions. The poor success of both policies in stimulating agriculture made it plain that where economic and geographic factors are unfavorable, even the most liberal land laws can do little to promote close settlement. Moreover, these experiences brought home to the Australian colonies the lesson that, to insure such a disposition of the remaining Crown land as would best serve the public interest, it was essential that this land should, as far as possible, not only be surveyed, but carefully classified. What course, in the light of this knowledge, land legislation has taken in the last 40 years, will be shown in a subsequent article in this JOURNAL.

REFORM OF THE AGRICULTURAL LAND SYSTEM OF GREAT BRITAIN

By J. P. MAXTON

THE land question has always been a controversial problem in Great Britain. It has been brought forward recently, however, in a more urgent form than before, and a great amount of interest has been aroused abroad by the new developments of policy that have been recommended to deal with the situation. The report of the committee of the Liberal Party,¹ for example, has caused a little surprise in the United States. Its main interest in Great Britain itself has been the suggestion that it will cause a redistribution of political parties.

From the point of view of the agricultural economist a more important contribution to the question has been made in a little book by C. S. Orwin, director of the Research Institute in Agricultural Economics, University of Oxford, in collaboration with W. R. Peel.²

Both the Liberal Party's report and Mr. Orwin's book come to the same ultimate conclusion in favor of some scheme of nationalizing land. Mr. Orwin's analysis, however, is non-political and presents something of a new approach to the subject. This new approach puts the agricultural economic factor in the foreground. The old basis of moral right or wrong in the ownership of land is set aside, and academic problems of economic rent do not matter. A change is advocated for the economic interests of agriculture.

No appeal is made by Mr. Orwin on any other grounds whatever.

It is hoped, in this article, to develop Mr. Orwin's argument in a way in which it may be understood best by students of the subject in the United States. Conditions in the United States are sufficiently dissimilar to make Mr. Orwin's proposals seem much more revolutionary than they really are intended to be.

It is proposed in this article to describe the elements of the tenant system which have made it of real economic value to agriculture and to show that the new proposals appear to be best suited to the needs and to the habits of the British farmer.

Evolutionary Aspects of English System

No legislative body of men ever sat down and consciously chose the system of land tenure in Great Britain as the system which was either socially or economically the best. The system is entirely a historical development. Its deep foundation is made up of a few Roman relics, and of the remains of Celtic tribalism and Norman feudalism. The superstructure has been built up to meet the needs of growing industrialism and commercialism. Foundations, needless to say, are always a very important factor in deciding the kind of building that will be erected.

¹ *Land and the Nation*, Report of the Land Inquiry Committee of the Liberal Party, Hodder and Stoughton, London, 1925.

² *The Tenure of Agricultural Land*, by C. S. Orwin and W. R. Peel, Cambridge University Press, London, 1925.

The historical side of the British land system has been given a great deal of consideration in English literature. It has raised the thorny controversy of the rights of ownership of land. The thesis that "economic rent" is robbery, or, at least, economically unjustifiable, has also been thoroughly argued in various economic works. For the purpose of showing the present situation, however, the righteousness or unrighteousness of the landowning system of Great Britain can be passed over.

Description of System

In the first issue of the JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS, Sir Henry Rew gave the following concise analysis of the system which has existed in Britain for over a century: "Under the typical English system, the landowner provides the land and permanent equipment. The tenant provides working capital and management, and the laborer provides manual work."²

The arrangement is not quite universal. There are exceptions where, on a small holding, the labor is performed by the holder himself and his family; and secondly, where a man occupies a farm which he owns himself. In the first case, a specialized laborer is dispensed with; and in the second case, a specialized landowner is cut out.

These exceptions form a very small part of the total. Table I shows how general is the main system, as Sir Henry Rew described it.

Further allowance must be made for the fact that at least a fair proportion of the pre-war figures consists of what

TABLE I. PERCENTAGE OF AGRICULTURAL LAND IN GREAT BRITAIN FARMED BY OWNERS*

Country	1913	1923
England and Wales..	10.65%	24.2%
Scotland.....	11.0	18.7

* Agricultural statistics for England and Wales for 1913 and 1923. Also for Scotland.

are called "home farms." These are run in connection with the mansions of the landowners. They are not farmed primarily for profit.

It can be seen how completely the tenant system predominates in British agriculture. In 1915, almost 90% of the land was farmed by tenants.

Differentiation of Function

This high percentage of tenancy is a feature which Americans find difficult to appreciate. It amounts to a differentiation of function—a form of specialization. America considers the owning of land and the farming of land as one job. In Britain they are two separate jobs—the function of *owning* (or administering, to avoid confusion with other aspects of "owning") land, and the function of *farming* land.

In theory and in law, all land in Great Britain belongs to the Crown. In practice, private individuals hold the land without legal question. The right of holding it from the Crown, however, may be said to imply a corresponding duty of administering it for the best interests of the community.

Let us examine how this separation of function has operated in the past.

View, first, the individual farm. The landowner provides the farm house, the byres or cattle sheds, the stables, barns, laborers' cottages, fences, drainage, in-

² Rew, Sir Henry, "Land Ownership in England since the War," THE JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS, January, 1925, p. 18.

TABLE II. SUMMARY OF LOTTING IN
YORKSHIRE ESTATE

Number of Lot	Acreage	Type of Lot
1	265	Farm
2	135	Farm
3	130	Farm
4	224	Farm
5	144	Manor Farm (home farm)
6	171	Farm
7	147	Farm
8	109	Farm
9	121	Farm
10	236	Manor Farm (home farm)
11	64	Small Holding
12	7	Small Holding
13	5	Small Holding
14-21 incl.	2	Cottages and Gardens
22	19	Small Holding
23	7	Small Holding
24-26	3	Cottages
27-28	.5	Old School House and Garden
Total	1,789.5	

ternal roads and so forth.⁴ He usually provides every form of capital, indeed, which has a considerable degree of permanency.

The tenant has complete control of the financial and technical operations of the farm. He provides all live stock, operating machinery, all manures (except sometimes lime) and the working expenses for the payment of labor, seeds, and so forth. In fact, he supplies all the temporary capital which requires yearly, or at least frequent, renewal.

In Scotland there is usually a lease or agreement between the landowner and the tenant which fixes the conditions of tenancy for a period of, usually, 19 years. The money rent and all provisions are clearly set down in writing. It is almost always drawn up by a lawyer and signed by both parties in the presence of their legal representatives.

The lease gives security of conditions

to both parties for a considerable period. It is not so necessary now under the provisions of the Agricultural Holdings Acts as it was in former days.

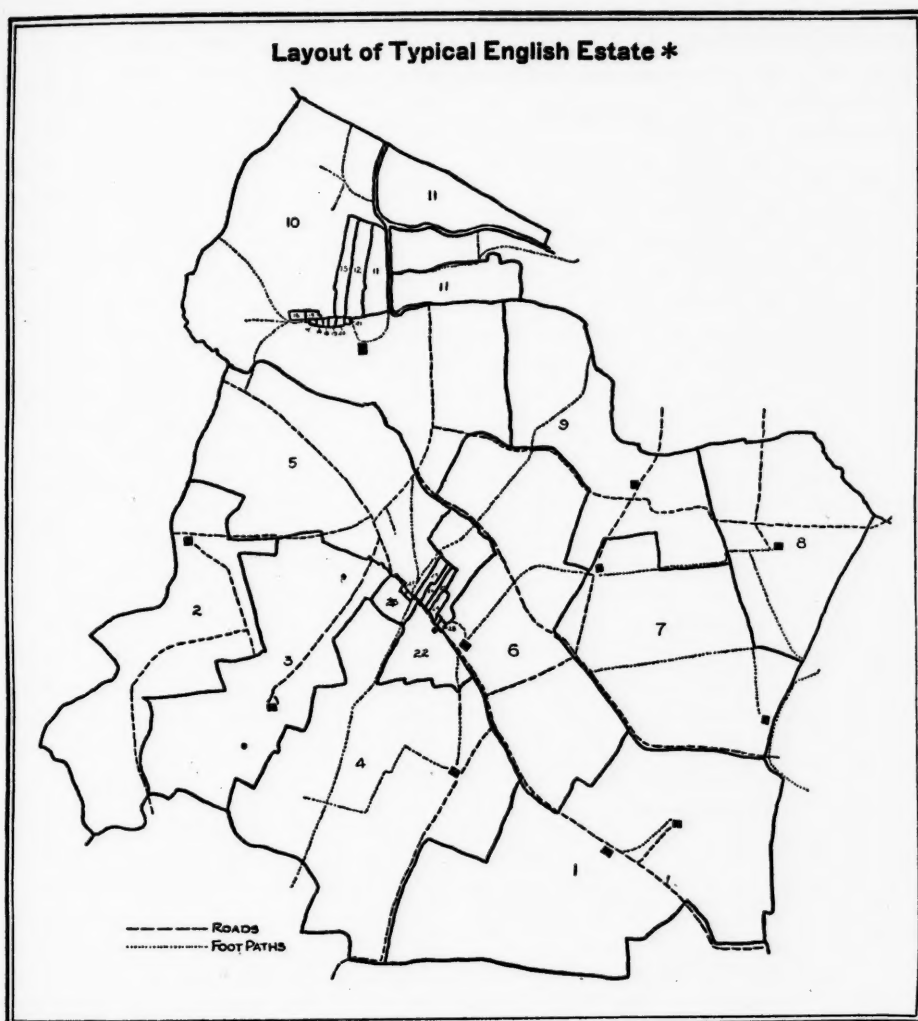
Long leases are not common in England. In most cases, agreements, where they exist in writing at all, are from year to year, without any special renewal being made out. Formerly, this lack of satisfactory agreements covering a period of years led to much hardship and in many cases to petty tyranny. The Agricultural Holdings Acts, however, have remedied these hardships arising out of the old customary year-to-year tenancy system.

Rent is paid yearly or half-yearly in cash. Share tenancy is very rare. Formerly, as late as the nineteenth century, the old "steel-bow" system was common in Scotland. The landowner in steel-bow supplied most of the stock, as well as the land and the permanent equipment. Grain rents or produce rents persisted for a long time in some isolated parts, but they are extremely rare now. The rent was actually paid in money. The agreed rent was so many bushels of grain or pounds of produce. Each year the money rent was calculated from the average price per bushel or pound. The stipends of the clergy in Scotland are still computed on that basis annually, although they are actually paid in coin to save the clergy from becoming a serious menace on the grain and produce markets.

The Estate as the Unit of Landowning

The real difference between tenancy as it exists in America and tenancy as it is in Great Britain can best be seen when we leave the consideration of the individual farm and pass to the *estate*.

⁴ See Chart I and Tables II and III.



* See Table II and Footnote 6 of the article.

The *farm* is the unit of farming; the *estate* is the unit of landowning in Great Britain.

Landowners as a class hardly exist in America. Men own several farms, but even where a man is the owner of a large number of farms, which he rents out, these are not necessarily contiguous. There are exceptions to that rule, of course, but, in the main, land is not

owned permanently for renting purposes in large continuous tracts as in Great Britain.⁵

An estate in Great Britain means a stretch of land covering a large, fairly

⁵ The plantations of the southern states furnish interesting points of similarity in organization, on the one hand, and on the other hand, very great points of dissimilarity in function, from the English estates.

coordinated area, and owned by one man. Estates vary enormously in size. There has been no complete census of landowning taken since 1875, when the *New Domesday Book* was made up. From the material available there, many estimates have been made of the arithmetic average size of the estates in the country. Average figures of that kind, however, give no reliable indication of the most common unit of landowning. It might be hazarded, however, that most of the agricultural land is administered in estates of over 5,000 acres. That is a random estimate and is decidedly a conservative one.

The figure itself has no value except to press the fact that the landowner-tenant system does not rest on a basis of an owner of only two or three scattered farms, but upon coordinated estates of over, in the great majority, 5,000 acres and some over 1,000,000 acres. Even where a landowner owns several tracts of land in different parts of the country, each tract is, as a rule, spoken of as an estate, and is usually operated as a unit.

Consider this unit of landowning, the estate, in its ideal condition, say, of an area of 15,000 acres. It is made up of probably 100 farms, of sizes varying from 50 to over 300 acres. It is managed by the owner or by an agent on his behalf. All the building repairs, renewals, fencing, draining, and road-

making are part of a general policy covering the whole area.⁶

The unified policy with regard to draining, roads, laborers' cottages, and so forth, on the technical side alone is valuable, but the financial policy which enables the expenses to be spread evenly over the whole area is, if anything, more important still. It means that an equal sum can be spent each year over a period of years on a pre-conceived, long-sighted plan.⁷

One of the most important advantages of the estate system is perhaps the far-sightedness which is possible in the settling of tenants on the various farms so as to benefit the estate. Considerations must be taken of good-neighborliness and good-husbandry, in addition to cash rent receivable. In a system of occupying owners, on the other hand, a retiring owner need not concern himself with anything but the maximum sum which he can get for the farm. The owner of the estate in choosing a new tenant must consider these other factors.

It has been suggested to the writer by men who are interested in settling men on the land in Canada that it would be better for colonization if there were fewer grants of isolated homesteads and more attempt to colonize from the start in limited, grouped areas. Banks, schools, stores, and other necessities of a progressive township

⁶The accompanying chart (Chart I) of a typical (except as to size which is only 1,790 acres) English estate may make clearer the separation of the owning and farming functions. The chart is an adaptation from a map used for sales purposes in 1914 to dispose of the Skewsby and Whenby portion of the Wigganorpe Estate in the North Riding of Yorkshire. The purpose is to show an estate (the unit of landowning) with the division into farms (the unit of cultivation) and allotments for the use of farm laborers. The location of the laborers' allotments with reference to the fields and footpaths to the work-

places is noticeable. Also the situation of the farmhouse for convenience and economy in arranging cultivation on each farm is worthy of mention. Roads and footpaths through the estate are also shown (see also Table II).

⁷Table III gives the five-year average incomes and expenditures (1816-1895) on one of the estates of the Duke of Bedford. Averaging for five years obscures many annual deficits, made up in other years, particularly during the latter years of the century. However, the table indicates the size and type of expenditures made by a landlord on behalf of his tenants and the community.

TABLE III. FIVE-YEAR AVERAGE CLASSIFIED INCOMES AND EXPENDITURES OF ONE OF THE DUKE OF BEDFORD ESTATES, 1816-1895*
(In pounds sterling)

YEAR	INCOME				EXPENDITURE (excluding Store-yard, Brick-kiln, Establishments)									
	Rents Received	Woods and Plantations	Income from Other Sources	Total Income	Taxation	Repairs and Maintenance	New Works and Permanent Improvements	Other Expenditure (Inc. Mgm.)	Woods and Plantations	GENERAL		Total Expenditure	Net Income	
										Churches and Schools (Inc. Works)	Pensions, Charities and Other Gen. Fynts.			
1816-20	30,934	9,367	510	40,811	4,756	6,095	100	2,626	Included Under Estate Headings	30	794	14,400	26,411	
1821-25	31,539	9,869	553	41,962	5,238	8,924	445	2,617		27	730	17,987	23,975	
1826-30	28,602	8,819	2,117	39,539	5,044	11,228	3,149	4,873		211	912	25,418	14,121	
1831-35	29,041	9,089	933	39,064	5,139	11,528	2,553	3,054		338	711	23,924	15,140	
1836-40	28,170	10,462	295	38,927	5,218	9,922	1,388	2,164		359	779	19,820	19,098	
1841-45	34,004	11,751	795	46,550	7,005	7,638	9,374	2,100	4,702†	275	1,339	31,493	15,057	
1846-50	36,015	14,262	987	51,263	7,371	6,642	14,087	2,076	4,722	513	1,788	37,199	14,064	
1851-55	34,727	9,358	1,381	45,435	7,664	5,534	14,082	2,635	4,303	622	1,819	30,659	8,776	
1856-60	40,939	9,488	1,072	51,499	8,045	6,286	15,299	1,956	4,344	1,484	1,718	39,134	12,366	
1861-65	41,905	8,284	524	50,713	7,508	6,523	13,678	2,210	3,909	2,705	2,663	37,263	11,450	
1866-70	44,418	4,329	844	49,592	6,659	11,304	7,987	3,778	3,334	12,952	3,159	49,174	418	
1871-75	47,281	5,559	880	53,721	7,312	9,999	3,801	3,498	3,157	4,212	6,905	38,884	14,836	
1876-80	44,464	6,382	990	51,816	7,917	7,752	9,272	7,560	3,291	6,881	3,997	46,671	5,145	
1881-85	36,434	5,497	9,861	51,793	7,220	5,765	5,011	16,342	2,894	2,339	2,818	42,380	9,404	
1886-90	29,779	3,317	4,714	37,811	6,328	3,459	3,334	8,466	2,452	4,451	2,850	31,330	6,471	
1891-95	26,854	4,143	1,591	32,588	6,351	5,768	3,909	5,451	3,409	2,327	5,457	32,673	—8	

*Duke of Bedford, *The Story of a Great Agricultural State*, Murray, London, 1897, Appendix A, pp. 218-225.

† Four-year average.

could then be available in those cases from the outset. As it is, many home-steaders live in isolation for a great many years before the land around them is sufficiently developed to provide them with these conveniences. These plans have points of similarity to the "close settlement" scheme of Edward Wakefield for New Zealand and Australia. The circumstances are, of course, not the same in the old settled rural areas of Great Britain, but there is an analogy to be drawn.

This system of landowning in large units (or administering land in large units) has, therefore, advantages in unified control and coordinated general effort along certain necessary lines. It is not a democratic system. It is feudal in origin and has never been wholly commercial in its development, but it has the advantages which have been outlined.

From the farmer's point of view, he

need not tie up any capital in land, which is very difficult to liquidate in time of need. There are many instances of this feature since the war. Many farmers in Britain during the prosperous days purchased (in many cases were almost forced by the alternative of "quitting" the land to purchase) their farms. They did so with the money which they were making on the rapid appreciation of their stock. When the slump in prices came and the money which was made by appreciation was required to meet depreciation, it was locked up in the ownership of the land. It might be pointed out that the banks in Great Britain do not, as a rule, lend money on land as security. Nor will they lend on stock. The British banks are organized to meet the needs of industry and commerce. The interests of these come first and their interests dictate the policy. In practice (this was noted of the Scottish banks by an Amer-

ican commission) short-term accommodations can be obtained quite readily by a well-known farmer from his local banker, for the most part on his personal bond alone, but short-term accommodations are a different factor in banking from the provision of mortgages. The Rural Credits Act (1923) is framed to meet this situation but so far has not been an outstanding success.

Under the tenant system the farm operator, so long as he has security of tenure and preservation against arbitrary treatment as to rent and interference, need not tie up capital in land. Yet he can maintain his efficiency as a farmer. In many respects he has more freedom as a tenant than as an owner. In addition, the system enables young capable men to get into the industry on a satisfactory scale with much less capital than would be required if they had to purchase a farm and its buildings.

The system is described in its ideal operation. There are various ways in which it rarely comes at all near to the ideal. To mention one respect only, there is a most efficient unit of land administration just as there is of farming. What that unit is has never been discussed. It varies probably with every set of circumstances, but obviously some estates, as at present constituted, are too small for effective administration, while others are too large.

The size of estates has never been chosen on economic grounds. Custom, inheritance, purchase, marriage, division and aggregation have been more important factors than motives of economic efficiency. If it has been made clear how, in the ideal condition, the landowning function may be efficiently performed in its relation to the farming of the land, this system is not so stupid and reprehensible as many Americans at first sight (looking at it from

the standpoint of their own conditions) may think.

The Climax of Landowning

We may assume that the ideal condition (which never has existed) was most closely approached in the late eighteenth and early nineteenth centuries, the period of the "enlightened landowner." The feudal aspects had become (legally, at least) inoperative. The enclosure movement was more or less completed. Farms had reached their modern structure. Education among the ordinary farming class was defective or non-existent. Opportunities for travel even in their own country seldom arose for that class.

Not so the landowners! They were the wealthy class of the period. They had at least the facilities for education, and there was a considerable amount of traveling done both at home and abroad by some of them. The landowners, therefore, obtained the ideas. The name of Coke of Norfolk adorns this period. There were many landowners (not by any means all, of course) who adopted the same policy of directing their tenants towards the new methods.

It was an economic movement. The big development of the machine industries and the need for supplies of food for cities made it profitable to abandon the old domestic style of farming and adopt more commercial methods. The farmers were conservative and comparatively ignorant. The landowners took the lead.

In Scotland, covenants (they were called covenants at first, at a later period they were called restrictions by the tenants) were inserted in leases forcing tenants to give up the old three-field system and adopt the Norfolk

four-course or its equivalent. Certain systems of manuring were stipulated. It was forbidden to sell crops like hay and roots off the farm. These had all to be consumed by stock on the farm and returned to the land as farm-yard manure.

For 80 years from the beginning of the nineteenth century, average prices of farm products were rising or steady. Rents rose steadily most of the time. It is not unfair to say that more development in the permanent equipment of the land and in reclamation of waste was done during that period than was ever done before or has been done since. The money was expended by the landowners out of the rents received. The farmers were free to use what profits they made on better or more manure and better or more live stock. It can be seen how beneficial the system of differentiation of function was at that time.

Agricultural Decline

About 1880, the break came. Bad harvests around 1880 brought real distress. At first, it was looked upon as temporary, but, as is well known, the decline in prices continued to the end of the century. An interesting comparison of the two periods, before and after 1883, shows that from 1800 to 1883 the price of wheat only twice (in 1835 and 1851) fell below 40 shillings per quarter,* whereas from 1883 to 1900 the price never rose even once above 40 shillings.

At the beginning of this period of decline, another phase of the benefits of the differentiation of function can be seen. Farmers were badly hit by low prices and poor crops. Balance-sheets

of several large estates which have been investigated show how the landowner absorbed at least a part of the shock. Large estates, by reason of their size and greater financial resources, were able to take the blow better than the individual farmer could ever have done without outside help.

Any financial house might, perhaps, have helped the farmer with credits in the same way. But financial institutions specially interested in helping the farmer did not exist, for the reasons referred to above that banks were founded and maintained in the interests of industry and commerce. Also, the landowner, or his agent, knew all about his tenants and about their stock and their land. These are excellent conditions for the giving of credit from the landlord's treasury.

Landowners met the situation in various ways. Many gave yearly rebates of rent of 10% to 15% to all tenants. Others considered special necessitous cases and gave rebates up to even 25% of rent. Others preferred to spend more money on draining or liming or other capital expenditure which would increase the yield of the land. No doubt many even lent cash to their tenants.

This trying period, however, constitutes the turning point in the leadership of the landowners. The low prices and adverse market conditions were to be more or less permanent, not temporary, as was believed at the time. Rebates of rent from year to year did not meet the situation. Permanent reductions of rent upon new leases began to occur from 1885 onwards. (These facts apply especially to Scottish conditions.)

By the end of the century, gross incomes derived from the owning of agricultural land, that is, all rents without

*The imperial quarter is a dry measure which in wheat is equivalent to 480 pounds.

TABLE IV. ANALYSIS OF GROSS RENTS IN GREAT BRITAIN, 1907*

Particulars	Pounds Sterling	Percentage
Total gross rent.....	35,500,000.	100
Tithe, taxes, management and insurance.....	3,800,000.	10
Repairs.....	3,800,000.	10
Improvement and sinking fund..	5,775,000.	15
Interest on landowners' capital..	16,170,000.	42
Net economic rent.....	8,855,000.	23

*Analysis made by Sir Josiah Stamp.

deductions of any kind, were only half of what they were in 1880.

Changes in Performance of Land-owning Functions

What effect did the new situation have on the internal economy of the estates?

Sir Josiah Stamp made an analysis of Gross Rent in 1907.⁹ No responsibility is accepted for the accuracy of the analysis. The figures on which these calculations are based are not perfect for the purpose, and the results must be accepted on the reputation of Sir Josiah Stamp.

He divides gross rent for the whole country into component parts as shown in Table IV. It is not necessary to have absolute faith in the actual figures or percentages of this table. The classification of the various items is the important thing. The percentages act as rough guides to the relative importance of the various items. They are regrouped in Table V.

When rents began to decline, what items in the above table were most affected? Taxes increased during the period and, of course, had to be paid. The other items are here divided into (a) those which were directed to main-

⁹ Sir Josiah Stamp, *British Incomes and Property*.

taining and improving the efficiency of the land by means of permanent equipment, and (b) the two items which make up the private income of the landowner. All of these items, with the exception of taxes, can be proportioned according to the will of the landowner.

The landowner was faced with meeting all the decrease out of his private income. As the large proportion of landowners at the time were almost wholly dependent upon their rents for their income, that solution of the problem would have involved an extraordinary sacrifice.

If all the decline had been met out of the landowner's income, whether out of the group headed "interest" or out of the group headed "economic rent," then the permanent equipment of the farms was not only maintained but was constantly improved to meet new developments. No harm in that case was done to agriculture.

If the decline had been met out of the "economic rent" item, then still less harm was done, for the landowner's capital continued to earn a good rate of interest, and the inducement to sink capital in land remained.

Unless strict accountancy principles are followed in the management of estates, however, all of the gross rent is looked upon as personal income. Taxes have to be paid out of it, but that is a burden on all incomes. For the rest, a landowner may use the money

TABLE V. DISTRIBUTION OF GROSS RENT

Expenditure by landowner	35%	(a) Taxes, management and insurance	10%
		(b) Repairs and improvements.....	25%
Income to landowner	65%	(a) Interest on capital	42%
		(b) Net economic rent	23%

as he thinks fit. The necessity for allowing for depreciation is not so urgent as it is in most industrial and commercial concerns. The capital equipment of the agricultural land can be run down for a very long time before the process becomes a glaringly obvious folly.

The tendency naturally was to endeavor to maintain the private income as much as possible. So far, no really reliable statistical evidence can be produced to show what happened to the proportional distribution of the gross rents during the last 50 years. Certain figures made up from various sources for Scotland would indicate that, on the best estates at least, the percentage of the total gross rent spent on repairs, and the like, was kept at a constant figure. The total sum, however, of gross rent declined by half during the 50 years. The percentage, therefore, though the same as formerly, now represents only half of the sum formerly spent.¹⁰

Land equipment probably suffered in two ways. Repairs were delayed or not done at all. Secondly, landowners used a portion of the rents which formerly would have been invested in the land by way of developments, to invest in industry or commerce in order to maintain their falling incomes.

Another aspect of the question is dealt with in Mr. Orwin's book, *The Tenure of Agricultural Land*. The older type of landowner with the old traditions of landowning in part left the countryside and was replaced by a newer type which desired to own land, not for profit or for interest in the wel-

fare of the land, but for the social prestige which was supposed to accompany the ownership of land. There is also a newer movement of land-subdividing by real estate dealers, whereby farmers are to a certain extent being forced to become the owners of their farms, whether or not they want to or can afford to.

Effect of Poor Performance of Land-owning Function on Farming

The result certainly has been that the land has been starved of permanent equipment. Old agricultural writings of the early half of the nineteenth century are full of reports of big reclamations, drainage, new building, and so on. It would be difficult to find development on a similar scale at any time in the last 50 years.

The growth of that body of legislation which is known under the consolidated title of the Agricultural Holdings Acts of England, Wales, and Scotland traces this decline in the leadership of the landowner in the period from 1880 to today.

These acts, which date from 1875 in England, were designed to secure stable conditions for tenants. Among other items the principal clauses refer to the compensation which a tenant may claim at the end of a lease or tenancy for improvements which he has made to the farm during his tenancy—improvements, that is to say, which increase the renting value of the farm and whose benefit has not been exhausted by the time the tenant leaves the farm. The schedules of the acts

it. The position was probably worse than is made out here. After 1900, prices and costs of labor and materials began to rise. As a result, therefore, £50 spent on repairs would represent actually less work being done.

¹⁰ The fact is simple arithmetic and looks much easier in figures: 10% of £1,000 in 1885 equals £100 spent on repairs; 10% of £500 in 1900 only equals £50. There is nothing mysterious about

have lists of the various improvements for which a farmer may claim compensation. There are contained in the schedules all of the improvements and repairs which the landowner is supposed to perform under the principle of differentiation of function outlined above. This is an indication that tenants have been in the position of having to do these things for themselves if they want them done. Indeed, it is claimed that most of the repairs and improvements effected in the past half-century on agricultural land have been done by tenants under the Agricultural Holdings Acts.

The ultimate outcome is that, while the separation of the function of owning or administering land from the function of farming land still remains, the former function is not being efficiently performed.

Attitudes toward Change

There are, of course, many thousands of people, including farmers, who do not see the need of change or want any change. Of those who do, there are two well-defined groups. There is the movement toward ownership of the land by cultivating farmers. This, however, is not a movement of the farmers themselves. It must be pointed out, in America especially, that the supporters of this movement do not advocate necessarily the occupying ownership of large farms of over 100 acres. It is a small landholder movement. It is the cry of "back to the land." It is aimed much more as a solution of the farm laborer's low standard of living problem and towards the repopulating of the rural areas than as a means of better farming on the lines of greater or more efficient production.¹¹

There is really no movement of any importance in Great Britain towards making every farmer his own landowner. In many respects the policy is looked upon as a retrograde step. Britain is almost the world's exception in this point of view. Britain, however, as a highly industrialized nation of longer standing in that respect than any other country, has conditions to contend with entirely different from those in the rest of the world.

The other movement is toward nationalizing the land. If the purpose of this article has been made clear, it will be seen that there is an attempt to prove, (a) that the ideal system of the separation of the functions of landowning or "administering" and farming can be claimed as a good system for Great Britain, and (b) that the system has broken down, *not because the separation is a bad one*, but simply because the landowning function is being imperfectly performed.

The whole advantage of the presentation of this point of view will be clear if it is realized that, under the circumstances which have been outlined, Mr. Orwin's proposals looking to land nationalization are a less drastic step than a scheme to make every farmer his own landowner would be. The step would consist of a transfer of landowning functions from the private landlord to a public landowner and administrator.

The Orwin and Peel Scheme

The scheme advocated by Mr. Orwin is briefly this:

Buy out the present owners of agri-

¹¹ See Ernle, *The Land and Its People*, Hutchinson, London, 1925, Chapter VIII, on "Fallacies about Landlords." Also C. H. Turner, *The Land and the Empire*, J. Murray, London, 1917.

cultural land (only agricultural land; he leaves urban land alone). Many of the owners will, it is thought, be very willing.

Establish a land service, as a branch of the civil service, with a central headquarters and more or less centralized administration. In this respect, his scheme is at variance with the Liberal Party's scheme, where a local elective body will not appeal to farmers, who will object to some of their immediate neighbors' having too much knowledge of their affairs. Also, by his scheme national uniformity of purpose will be obtained.

Redistribute the existing estates so as to operate the most efficient unit of land administration.

Put in charge of each unit a highly trained civil servant. He will perform at a salary all the duties performed now by the existing land agent also at a salary. He may, in some cases, be the same man.

If the scheme is seen in its simplest form, it will be evident how little it need upset the farmers' present circumstances. He would still pay his rent, grudgingly as before. He need not adapt himself to handling a new form of capital by owning his land. He will have the same security as under the Agricultural Holdings Acts now.

The American is likely to raise the question: Will the tenant continue to pay rent under public ownership? Apparently the American experience with public ownership and tenancy has been that sooner or later the tenants use their political influence and voting rights to forego rents and acquire ownership in fee simple.¹² Perhaps the

wide diffusion of the voting franchise and the custom of individual ownership in fee are responsible for this tendency under public ownership in the United States. But because this has been the experience in the United States is no reason for supposing that similar results are inevitable in Great Britain. The customs and traditions of land ownership and political activity in England are far different and are at least plausible circumstances justifying an interpretation that runs counter to American experience.

Also there is perhaps a good deal of reluctance, on the part of the American people, to throw so much power into the hands of civil servants. There are, however, old traditions of public service and honor in Great Britain which have perhaps not yet had time to grow strong in America, for America is still, comparatively speaking, a new, developing country. Britain has been established "quite a little time." Also, Britain is a small country geographically. All of these factors tend to make public representatives and servants a more trusted and respected body of men and women.

Strong criticism is advanced on the American side of the Atlantic that the scheme looks very much as if the nation were being asked to take over a bankrupt concern. The farmer, it is said, would probably benefit in the way of better equipment. The landowners are getting rid of a bad investment. The only people who are going to pay are the taxpayers of Great Britain.

It is not absolutely necessary that the undertaking should be a financial loss to the nation, although it is now a bad investment for individual owners. There are many elements of saving by more efficient administration and by better coordination of areas. Apart,

¹² Cf. Shine, M. L., "The Public Leasehold System of the United States," *THE JOURNAL OF LAND & PUBLIC UTILITY ECONOMICS*, July, 1925, Vol. I, pp. 322-335.

however, from the primary balancing of accounts, it is generally recognized by governments today that they will have to foot a considerable bill for the maintenance and development of agriculture, whether directly by making clear subsidies or indirectly by tariff or by disposal of market surpluses. Great Britain already advances considerable money for drainage and certain other improvements. There is some expense also in the administration of the Agricultural Holdings Acts and the Scottish Land Court. Furthermore, the operations of the small-holdings schemes are a cost to the nation in taxes.

By Mr. Orwin's plan much of that work would be simplified. In addition, even if the balance is still adverse, there are few ways in which a subsidy could be more usefully applied.

The land must be administered by somebody. At present it is being done in a bankrupt way. Who has more interest in putting the function of land-owning on a sound footing than the nation which gains as a whole from having a prosperous agriculture? Even the die-hard classical economists admitted that a function of the state was to do what could not be efficiently done by private enterprise.

DEPARTMENTS

The departments of the JOURNAL are edited specifically with regard to their interest to the readers who are especially concerned with the economic problems of land and public utilities. For the most part the material for the departments will be prepared by members of the staff of the Institute for Research in Land Economics and Public Utilities.

BOOK REVIEWS

This department contains critical reviews and brief notices of new books of interest to the readers of the JOURNAL.

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BOOK REVIEWS

Murray, W. S. *SUPERPOWER—ITS GENESIS AND FUTURE*. New York: McGraw-Hill Book Company, Inc., 1926. pp. ix, 237. \$3.

Under the caption of "Superpower" the author of this book touches upon a wide range of subjects more or less intimately related to the problems of interconnected electric power systems. The 15 chapters are lacking somewhat in unity, each being practically an independent topic.

The subjects treated are, in order, power, the birth of electric utilities, ownership of utilities, political ownership, the superpower survey, what has been done, railroad electrification, superpower and interstate relations, superpower and the Interstate Commerce Commission, Federal Power Commission, financing superpower, superpower and economic studies, with a chapter on processed fuels.

The first chapter consists of a brief survey of the power equipment and power output in the United States for the past two decades and an outline of the principles and advantages of superpower. Three chapters following are concerned with the form of ownership of public utilities, whether public or private, and numerous quotations and citations are given in an obvious attempt on the author's part to point out the disadvantages of public ownership. The chapter on "political ownership" is devoted almost entirely to an analysis of the Hydro Electric Power Commission of Ontario, which operates many of the publicly owned plants of that province. The summary of conclusions of a report to the National Electric Light Association in which the Hydro Electric Power

Commission is adversely criticized is embodied in this chapter. A movement in this country to establish a power commission with powers similar to the Ontario commission is strongly condemned by the author.

The fifth chapter discusses the Northeast Superpower Survey, a survey carried on under the direction of the Department of the Interior by a committee of engineers headed by the author of this book. The author reviews briefly the steps leading to the authorization and formation of the committee and the methods pursued in the preparation of the report, and then summarizes the findings of the committee together with its recommendations. The sixth chapter describes the superpower systems now in operation, with special reference to southeastern United States and the Pacific coast.

A chapter on railroad electrification discusses at considerable length the technical difficulties which have retarded railroad electrification in the past and the economic problems which such a program presents. To the reader who attempts to follow the detailed discussion of the types of systems used in railroad electrification the relation of superpower to the transportation problem is somewhat obscure. One feels that an analysis of the relation of superpower to industry, a far larger consumer of electrical energy than the railroads, with a discussion of the possible decentralization of manufacturing and the enlargement of industrial opportunity would have been more appropriate.

Four chapters devoted to a discussion of the relation of electric utilities to the

public scarcely touch upon the superpower idea. Quotations from Mr. Hoover and others on the problem of interstate transfer of energy and the most desirable method of regulating it are given. One chapter is devoted to an attack on the proposed regulation of public utilities by the Interstate Commerce Commission or similar federal body and is followed by a chapter giving unqualified praise to the state public service commissions. A short chapter on the Federal Power Commission consists of a quotation from the late President Roosevelt on the need of a body regulating internal waterways followed by a quotation from the *Fourth Annual Report* of the Federal Power Commission pointing out the chief defects of the Water Power Act. The duties and powers of the commission and its relation to superpower development and control are omitted from the discussion.

The entire treatment of the public service commissions gives the impression of being an argument for the existing method of public utility regulation with no attempt to make a critical analysis of its merits. Nowhere is there a hint that superpower may present problems of regulation not found elsewhere.

The last two chapters, one containing numerous graphs and tables showing the increase in output of electrical energy since 1920 and the other consisting of an extract from the Appendix of the Northeast Superpower Report on the "Use of Processed Fuel and Pulverized Coal," may well have been put in an appendix.

To the reviewer the book, as a whole, lacks that critical, dispassionate, economic analysis which economists would like to see given to this subject. There is need for such a well-rounded consid-

eration of the economics of superpower to temper some of the visionary enthusiasm with which this subject is often discussed. However, Mr. Murray has assembled many interesting data which have value from the engineer's point of view.

W. H. VOSKUIL

Reiss, Richard. *THE NEW HOUSING HANDBOOK*. London: P. S. King & Son, 1924. pp. vii, 199. 4s 6d.

The New Housing Handbook is concerned with the subject of housing in Great Britain. It is a historical treatise of England's experiences in solving the housing problems. Under the above title, Mr. Reiss has prepared a book for the convenience of a special group of readers, such as contractors, architects, real estate operators, and local government authorities. However, the book is not without interest to the general reader.

The purpose of the book, as set forth by the author, is to indicate: "(1) The size and nature of the problem; (2) The legislation which has been passed for the purpose of enabling houses to be built and slums to be cleared; (3) the various means by which full advantage can be taken of this legislation so as to secure the building of an adequate number of new houses, the closing and repair of unfit houses, and the clearance and improvement of slum areas."

The content of the book is technical but broad in scope. The first two chapters set forth the problem and discuss in detail the provision of houses and the necessary steps which should be taken by local authorities and the public in order to supply an adequate number of homes. In 1924 England was faced with an estimated shortage of 1,750,000 houses. In addition, she usually needs 100,000 new houses annually to supply the

normal demands due to an increasing population and the wearing out of houses.

Chapter III is a comprehensive digest of housing legislation from 1885, the year of the first significant enactment, through to the Consolidation Act of 1924. The most important acts are the Housing and Town Planning Act, 1909, and the acts of 1919, 1923, and 1924, commonly referred to as the Addison Act, the Chamberlain Act, and the Wheatley Act. The administration of the last three acts under the Coalition Government, 1918-1922, the Conservative Government, 1923, and the Labor Government, 1924, is discussed carefully in the succeeding two chapters. Chapter V includes the four reasons why previous housing programs have failed and the four principles upon which Mr. Wheatley formulated his housing proposals.

The next four chapters are of particular interest to the building operatives. The question of how to obtain an adequate force of skilled labor is given a separate chapter, as is the subject of the cost of materials. The author suggests a means of escaping profiteering on building materials. Also, the advisability of a local authority employing its labor directly or through a contractor is considered.

Other interesting sections deal with the subjects of financial assistance which can be obtained from the state by local authorities and individual citizens; provisions of existing acts in controlling rents; the type of houses that should be built; how an estate should be laid out; measures which should be taken to deal with existing unfit houses and unhealthy areas. The last chapter is a suggested practicable housing program. Appendix I contains the text of Part I of the Chamberlain Act; Appendix II, the full

text of the Wheatley Act; Appendix III has tables showing the variation in the rates of wages of building-trade operatives since 1912.

Mr. Reiss has made a contribution to the literature on housing. In presenting a digest of material, he has brought out the important points, focusing attention on Parliamentary acts and their consequences. At the same time he has brought his discussion into proper proportion with the housing problem as a whole by discussing related topics. Throughout, Mr. Reiss has been generous with references as he mentions and discusses the various subjects. This should be helpful to the interested reader and to the student of housing. The treatment is historical and analytical, but where possible Mr. Reiss offers his own suggestions. It is short and concise, and should prove valuable as a handbook.

GERTRUDE HARLEY

Pond, Oscar L. *A TREATISE ON THE LAW OF PUBLIC UTILITIES*. Third Edition Revised. Indianapolis: Bobbs-Merrill Co., 1925. pp. xcvi, 1065. \$10.

In preparing this contribution to the field of public utility law, the author has for the most part merely enlarged and brought up to date his original work, which was published in 1913. The approach followed in the two volumes is nearly identical and the original presentation is varied only in so far as the chapters have been amplified and additional ones added—two on the regulation of motor vehicles, and one on the subject of appeals from the state commissions.

These three additional chapters are timely and add to the volume much that is of value. The problem of motor-vehicle development and competition with electric and steam railways is at

present one of the most perplexing in the regulatory field. The question of appeals from the decisions of the state commissions has always been a crucial point in the development of effective regulation by those bodies. As Mr. Pond points out, the attitude of the courts toward the commissions largely determines the effectiveness of public control.

Chapter XXVIII presents a most comprehensive analysis of the regulation of motor vehicles. "Motor vehicles," to quote Mr. Pond, "operating upon our streets and highways for hire as common carriers, are subject to the same regulation and control as other public utilities." The author devotes 110 pages to a discussion of the nature and scope of the regulatory policies of federal, state, and local agencies regarding motor vehicles operating as jitneys, busses, taxicabs, feeders for street railways, and as other forms of motor transport. Perhaps the crux of the whole problem is the proper coordination of the steam, electric, and motor systems of transportation. Mr. Pond recognizes this and has attempted to present the subject in its broader as well as in its more technical aspects. The policies of various state commissions concerning the competition of motor-transport agencies with the electric and steam railways are given. The author discusses the authorities and principles peculiar to the industry, and in this connection he has compiled references to the recent decisions of the federal courts, a large majority of the state courts, and the District of Columbia.

In considering commission control, Mr. Pond shows how the tendency has been to preserve the necessary transportation systems by refusing licenses to

motor lines which are not essential to the convenience of the public and which serve only to deprive existing systems of a fair profit. The granting of permits to motor lines has, of course, hinged upon the construction placed upon "convenience and necessity" by the regulatory bodies empowered to authorize additional systems.

In Chapter XXXIII, Mr. Pond presents "memoranda of the regulations, restrictions, and special taxes on motor-vehicle common carriers in force in the respective states on January 1, 1925." This chapter is useful as a source for general reference. Information is given regarding the situation in each of the 48 states.

It is well known that some of the chief difficulties attendant upon the development of efficient commission regulation have been the lengthy appeals to the courts and the investigations and embarrassing reversals of commission findings of fact, on the part of the appellate courts. The effectiveness of control has been dependent upon the cooperation of the judiciary. During the last decade, the law governing appeals from the decisions of commissions has developed rapidly and to a certain extent has become crystallized. In preparing his chapter on this phase of public utility law, Mr. Pond has performed a timely service, and its inclusion in this edition adds to the breadth and usefulness of the volume as a reference work.

One does not usually find in legal reference works the up-to-date, thorough treatment which is found in this volume, exemplified by the inclusion of the subject of motor-vehicle transportation. Mr. Pond has not been content to tread merely upon the sure ground of public utility law, but has endeavored

to keep abreast of the times by entering a phase of the law which is not yet fully crystallized.

JOHN D. SUMNER

Textor, Lucy Elizabeth. *LAND REFORM IN CZECHOSLOVAKIA*. London: George Allen and Unwin, Ltd., 1923. pp. 157. 5s. net.

One of the most interesting developments following the World War was the change in land ownership that took place in eastern Europe. In 1919 and the following years Austria, Roumania, Jugoslavia, Czechoslovakia, Poland, Hungary, Latvia, Esthonia, Bulgaria, Lithuania, and Finland passed laws the chief object of which, in most cases, was to break up the great estates and bring land into the hands of peasant cultivators.

The present volume is a careful and complete treatment of the land reform in one of these countries, Czechoslovakia, as far as it had developed by the end of the year 1922.

Beginning with a historical account of the development of the land problems that the new laws were designed to meet, the author then considers the situation among the political parties which complicated the passage of the laws leading to the reform. The Constituent National Assembly of the new state was not an elected body, but consisted of representatives nominated by the different political parties among the Czech and Slovak races, the Germans having declined to participate; and all these parties, looking to later elections, gave their support to the idea of land reform. "During the whole of the long discussion not a voice appears to have been raised against expropriation," the author tells us.

Not all of the parties were agreed as to the kind of land reform that was

wanted, and the first law was the result of many compromises and was intentionally ambiguous in some of its provisions. All the details of the reform were settled by later laws, and these later laws are fully discussed in Chapters III to VII, inclusive. Chapter VIII discusses the movement begun many years before for "commassation," that is, the exchange of parts of their holdings by the peasants so that compact farms are substituted for scattered strips.

Chapter IX discusses the different elements in the opposition to land reform. Chief among these, of course, were owners of the expropriated estates, who, though compensation was allowed them, felt that their property rights were being invaded. The expropriation of the land itself was accepted as more or less inevitable, but the taking of forests and, especially, of estate industries such as sugar factories and breweries was fought vigorously, and with some success. Another element of opposition was made up of the employees on the great estates who, although favoring the land reform at the beginning, became opposed to it when they discovered that it was depriving them of the means of livelihood without establishing them on farms of their own. Another opposing group was the German part of the population, which felt itself discriminated against both in expropriation and in allotment of land, though the author doubts whether there was any real discrimination. The Roman Catholic Church, because it is one of the greatest landowners, also opposed the reform.

The final chapter gives the author's conclusions, which are concerned chiefly with the political, administrative, and social sides of the problem rather than its economic aspects, though the latter

are touched upon. The author believes that "the break-up of the great estates and their partition among the peasants was determined upon without a careful study as to how it would affect production," but she is hopeful that economic evils will not result, though changes in the types of production will necessarily follow the substitution of small farms for great estates.

The numerous footnotes give references, almost without exception, to original sources, such as laws, decrees, and newspapers published during the period, and reveal the painstaking care that the author must have used in gathering the material for this study. It is to be hoped that a later edition will have an additional chapter on the results of the carrying out of these laws, which, at the time the author wrote (1922), were still matters of the future.

MARY L. SHINE

Kleppner, Otto. *ADVERTISING PROCEDURE*.
New York: Prentice-Hall, Incorporated,
1925. pp. xvi, 539. \$5.

This book considers the beginning

of all advertisements to be an idea. It shows how these ideas are created, developed, and converted into printed advertisements. Although the book is written primarily for the national advertiser, it includes many things of interest to the local advertiser.

Of more definite interest are the chapters on: developing the copy; finer points in copy; layouts; the advertisement in print; engraving for the advertising man; newspapers; outdoor advertising; car-cards; dealer display advertising. It also presents a helpful glossary of procedure; advertising abbreviations; reading suggestions and bibliography, and an appendix of useful tables. It is illustrated throughout by concrete examples and especially prepared drawings and charts.

The advertiser will find the reading of this book a stimulant and guide to definite and orderly procedure in the preparation of his advertising, or a quick reference productive of specific information for immediate and practical use.

A. G. HINMAN

SUMMARIES OF RESEARCH

CLASS A TELEPHONE COMPANY TAXES

THE annual reports to the Interstate Commerce Commission by the telephone companies of the United States contain information on the basis of which it is possible to study the tax burden of this utility. Only Class A companies, which are companies reporting annual operating revenue in excess of \$250,000, have been used in this analysis, but the companies in this class account for 97% of the revenue of all classes of companies, thus constituting almost the entire industry.

In 1925, 68 companies had revenue in excess of \$250,000 and thus fall into Class A; in 1924 there were 78¹ such companies out of a total of 300 in all classes. The number of Class A companies has remained practically constant, being 77 in 1923, 75 in 1922, and 76 in 1921.

Taxes assignable to operations reported by Class A telephone companies quadrupled in the 10 years from 1916 to 1926 (Table I). Examination of the reports of the individual companies

TABLE I. TAXES ASSIGNABLE TO OPERATIONS OF CLASS A TELEPHONE COMPANIES, 1916-1925

Year	Amount
1916	\$15,710,912
1917	22,022,365
1918	24,423,016
1919	27,027,687
1920	30,276,231
1921	37,340,878
1922	43,875,022
1923	48,754,632
1924	53,782,781
1925	61,627,223

TABLE II. RATIO OF TAXES ASSIGNABLE TO OPERATIONS TO TELEPHONE OPERATING REVENUE FOR CLASS A COMPANIES, 1916-1925

Year	Revenue	Taxes	Percentage of Taxes to Revenue
1916	\$283,174,890	\$15,710,912	5.55
1917	318,066,185	22,022,365	6.92
1918	343,461,714	24,423,016	7.11
1919	409,683,483	27,027,687	6.60
1920	488,943,281	30,276,231	6.19
1921	541,196,417	37,340,878	6.90
1922	591,530,687	43,875,022	7.42
1923	647,112,210	48,754,632	7.53
1924	705,177,348	53,782,781	7.63
1925	791,507,221	61,627,223	7.79

discloses that taxes not chargeable to operations are infrequent and insignificant and may properly be disregarded in an analysis of this kind.

The telephone utility has experienced a remarkable growth in the years 1916 to 1926, and it is only to be expected that with an increase in the investment and a generally increased tax burden the total taxes would increase materially. Reference to some base to establish the relative burden is, therefore, necessary.

In terms of a percentage of telephone operating revenue, taxes assignable to operations have also increased materially, the ratio changing from 5.55% in 1916 to 7.79% in 1925. The changes from year to year during the 10-year period under consideration are recorded in Table II.

Relating taxes to revenue may be described as viewing the relative change in the tax burden of the telephone user. Measurement in this way is, nevertheless

¹ The decrease in the number of large companies from 1924 to 1925 was due to consolidation.

TABLE III. RATIO OF TAXES TO OPERATING EXPENSES BEFORE TAXES OF CLASS A TELEPHONE COMPANIES, 1916-1925

Year	Percentage
1916	8.41
1917	10.08
1918	9.95
1919	8.89
1920	8.07
1921	9.46
1922	10.51
1923	10.62
1924	10.84
1925	11.44

less, affected materially by the profitability of the industry. Another basis for comparison which omits this element of profitability, at least in its immediate effect, is the total of operating expenses.² When the burden of taxes is expressed as a percentage of operating expenses, the result is, however, very similar, showing an increase from 8.41% in 1916 to 11.44% in 1925. By years the ratio of taxes to operating expenses is shown in Table III. It will be noted that as an item of operating expense, taxes have increased steadily from 1920 to 1925 and were in 1925 the highest of any year under consideration.

The burden of taxation of this industry may further be shown by relating the taxes assignable to operation to operating income before taxes.³ This may be conceived as the burden on the investment. Since the base here is largely the difference between revenue

² Operating expenses before taxes and not including uncollectible revenues which are treated in the uniform account as revenue deductions.

³ This is the difference between operating revenue and operating expense plus other operating income (or deficit) and less uncollectible operating revenue.

and expense, it is affected by the profitability of operation in any year. The percentage of taxes to operating income before taxes has been surprisingly constant, however, since 1918, remaining close to 26%, with the exception of 1920, in which year the rise to 27.02% was probably caused by the less satisfactory operating results of that year. The significant increases in the tax burden measured in this way occurred in 1916 and 1917 when the ratio rose from 16.57% to 22.46% and then to 25.31% in 1918 (Table IV).

Federal taxes paid account for from a fifth to a fourth of the total tax bill of Class A telephone companies during the years 1920 to 1925. Omitting an occasional company which did not segregate taxes paid, the proportions found between Federal and all taxes are shown in Table V.

The taxes paid by the American Telephone and Telegraph Company were a considerable portion of the total taxes paid by Class A companies. This company's non-operating income is over twice as much as its operating income. It pays a much larger proportion of taxes in the form of Federal taxes than

TABLE IV. RATIO OF TAXES TO OPERATING INCOME BEFORE TAXES OF CLASS A TELEPHONE COMPANIES, 1916-1925

Year	Percentage
1916	16.57
1917	22.46
1918	25.31
1919	25.96
1920	27.02
1921	25.91
1922	25.85
1923	26.29
1924	26.30
1925	24.84

do the rest of the Class A companies. On the basis of the reports to the Interstate Commerce Commission it appears that in 1920, Federal taxes were 33.9% of the total taxes paid by the American Telephone and Telegraph Company; in 1921, 61.9%; in 1922, 61.5%; in 1923, 49.3%; in 1924, 58.7%, and in 1925, 64.0%. Excluding this company from the totals for all Class A companies, the proportion of all taxes paid as Federal taxes changes materially; in 1920 it was 19.9%; in 1921, 16.2%; in 1922, 26.2%; in 1923, 21.9%; in 1924, 21.3%; and in 1925, 21.1%.

Various income and revenue bases have been suggested for readjusting public utility taxation. Some light is thrown on the results that would be obtained from the use of operating income by the following analysis of the variation in the proportion of taxes to operating income before taxes for 73 Class A companies in 1925. The range is from 3.0% to 34.6%. Two companies paid less than 5% of operating

TABLE V. RATIO OF FEDERAL TAXES TO ALL TAXES PAID OF CLASS A TELEPHONE COMPANIES, 1920-1925

Year	Percentage
1920	21.1
1921	20.6
1922	29.8
1923	25.7
1924	26.6
1925	27.8

TABLE VI. RATIO OF TAXES TO OPERATING INCOME BEFORE TAXES FOR 73 CLASS A TELEPHONE COMPANIES, 1925

Ratio	Number of Companies	Ratio	Number of Companies
3.0	1	24.4	1
3.5	1	24.8	1
7.6	1	25.2	1
11.2	1	25.4	1
12.5	1	25.8	1
12.9	1	26.0	1
14.2	1	26.1	1
14.4	1	26.2	1
15.4	2	26.3	2
15.9	1	26.4	3
17.6	1	26.5	2
17.8	1	26.6	1
18.0	4	26.9	1
18.8	1	27.2	2
19.1	1	27.4	1
19.2	1	28.6	1
19.6	1	28.7	1
20.6	2	29.6	1
21.7	1	30.1	1
21.9	2	30.4	1
22.4	1	30.5	2
22.5	2	30.9	1
23.2	1	31.3	1
23.5	1	31.7	1
23.8	1	31.8	1
23.9	1	31.9	1
24.0	2	32.3	1
24.1	2	32.5	1
24.3	1	34.6	1

income before taxes, 3 paid less than 10%, 8 less than 15%, 13 paid from 15% to 20%, and 19 from 20% to 25%. From 25% to 30% there were 21 companies, and 12 paid over 30% of operating income before taxes. The array is in Table VI.

HERBERT B. DORAU

PUBLIC UTILITY FINANCING DURING THE SECOND QUARTER OF 1926

AN analysis of corporate financing, based on the records of the *Commercial and Financial Chronicle*, shows

that the total volume of corporate financing for the first six months of 1926 amounted to \$2,877,993,096, as

compared with \$2,522,472,163 for the first six months of 1925. Public utility financing amounted to \$1,200,962,202, or 41.73% of the total corporate financing for the first six months of the current year. During the first half of 1925 public utilities issued securities amounting to \$961,359,880, 38.11% of the volume of all corporate securities.

In 1921 the yield to the investor in public utility securities started on a downward trend. This downward trend continued in the second quarter of 1926. During this period all types of interest-bearing obligations sold at a price to yield 5.52% on the average dollar and 5.72% on the average issue. Corresponding figures for the first quarter of 1926 were 5.65% and 5.78%. Thus, the yield to the investor on all securities of all maturities dropped .13% on the average dollar and .06% on the average issue in the second quarter of the current year. Long-term securities yielded 5.53% on the dollar and 5.74% on the issue dur-

ing the second quarter of 1926 as compared with 5.63% and 5.75% for the first three months of the year. Short-term securities yielded 5.37% on the dollar and 5.64% on the issue during the second quarter. *Bonds and notes only* sold at a price to yield 5.46% on the dollar and 5.69% on the issue as compared with 5.53% and 5.71% for the first quarter of the current year (Table I).

The total volume of public utility financing reached an unusually high level in the second quarter of 1926. Total corporate financing for that period amounted to \$1,368,855,780. Public utility financing alone amounted to \$707,631,840, or 51.7% of the total.

Table II shows that the volume of public utility financing in the second quarter of 1926 far exceeds that in any other quarter since 1919. It is also to be noted that the volume for each month of the second quarter was unusually high. During May, 1926, the total volume of public utility financing

TABLE I. WEIGHTED AND SIMPLE AVERAGE YIELD AT OFFERING PRICE OF NEW PUBLIC UTILITY SECURITY ISSUES

YEAR	ALL TYPES OF SECURITIES						BONDS AND NOTES	
	ALL MATURITIES		LONG TERM		SHORT TERM		Weighted Average Yield	Simple Average Yield
	Weighted Average Yield	Simple Average Yield	Weighted Average Yield	Simple Average Yield	Weighted Average Yield	Simple Average Yield		
1925.....	5.58	5.81	5.66	5.83	5.55	5.86	5.56	5.78
1st Quarter.....	5.46	5.78	5.65	5.81	5.32	5.77	5.48	5.79
2nd Quarter.....	5.72	5.87	5.74	5.86	5.58	5.94	5.65	5.82
3rd Quarter.....	5.53	5.77	5.50	5.77	5.68	5.73	5.45	5.76
4th Quarter.....	5.77	5.82	5.77	5.80	5.76	6.02	5.65	5.77
1926								
1st Quarter.....	5.65	5.78	5.63	5.75	6.26	6.02	5.53	5.71
2nd Quarter.....	5.52	5.72	5.53	5.74	5.37	5.64	5.46	5.69

rose to an index of 230. The volume reported for this single month is exceeded only by that reported for May, 1924, when the index number reached 233. The months of April and June likewise report unusually large index numbers, 182 and 181, respectively.

The great increase in the volume of public utility financing reported for the second quarter over that reported for the first quarter of 1926 may be explained in large part by the material increase in the volume of stock recorded. During the first quarter, public utility companies issued stock with a total par value of \$119,020,362. In the second quarter of the year, the par value of the stock issued by these companies amounted to \$194,724,340, an increase of 63.6%.

An analysis of the securities recorded, based upon the type of utility making the issue, shows that telephone and telegraph companies and electric light and power companies very materially increased the volume of their financing in the second quarter over that recorded for the first quarter. During the first three months of the year, telephone and telegraph companies issued securities with a total par value of \$2,195,000. In the second quarter they issued securities to the amount of \$198,050,000. The total par value of securities issued by electric light and power companies increased more than 100%. During the first three months of the current year the total volume of financing of public utilities of this class amounted to \$131,364,200. In April,

TABLE II. INDEX NUMBER OF VOLUME OF PUBLIC UTILITY FINANCING*
1919-1926

	1919	1920	1921	1922	1923	1924	1925	1926
By Months								
January.....	100	67	55	46	122	112	199	173
February.....	48	28	25	47	66	89	172	125
March.....	25	27	25	43	94	78	144	115
April.....	5	38	25	50	64	112	69	182
May.....	15	38	35	150	66	233	103	230
June.....	26	20	9	96	92	122	118	181
July.....	41	25	115	44	21	104	90
August.....	20	11	33	22	40	62	93
September.....	54	44	34	147	34	77	110
October.....	24	33	33	77	59	112	92
November.....	8	21	119	43	161	69	102
December.....	20	63	53	54	135	111	153
By Quarters								
1st Quarter.....	100	71	61	80	164	162	299	240
2nd Quarter.....	27	56	41	172	129	271	168	344
3rd Quarter.....	67	47	105	123	55	141	170
4th Quarter.....	30	68	119	101	206	169	201
By Years.....	100	107	145	212	246	330	373

*Volume for January, 1919, First Quarter, 1919, and Year 1919 used as basis for computing index numbers for months, quarters, and years, respectively. Compiled from the records of the *Commercial and Financial Chronicle*.

May, and June these companies issued \$276,181,000 worth of securities.

Only two foreign utility issues were recorded during the second quarter of 1926. These two issues had a total par value of \$18,000,000, which was 2.5% the total volume of all public utility

financing. This is a decided decrease in the volume of foreign utility issues, since during 1925 and the first quarter of 1926 foreign companies issued more than 8% of the total volume of public utility issues recorded.

MARION C. RICHTER

MERCHANDISING OF OFFICES

A RESEARCH report on "Merchandising of Offices," made by members of the Institute Staff in cooperation with the National Association of Building Owners and Managers, has recently been finished and printed in pamphlet form. The results of the study do not readily lend themselves to

publication in summary form in this department of the JOURNAL. The table reprinted below is a sample of the data that were gathered. The study was made by Messrs. Albert G. Hinman, John L. Bergstresser, and Stanley W. Kadow.

RICHARD T. ELY

TABLE I. NUMBER OF TENANTS OF DIFFERENT BUSINESSES AND PROFESSIONS WHO HAVE OCCUPIED THEIR PRESENT OFFICES A CERTAIN NUMBER OF YEARS

BUSINESS OR PROFESSION	NUMBER OF YEARS																									TOTALS
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25 and over	
Accountants.....		2	1	2		1		1		1																8
Advertising.....	4	1	1	1			1	1		1																10
Architects.....						2	1			1		1		1		1				2						9
Associations and Public Offices.....	1		1				1																			3
Contractors and Engineers.....	4	1	2	1	2					1				1												12
Corporation Offices.....	1	2	3	1	1	1				1	1			2										1		14
Educational.....		1		1	1											1										4
Financial.....	3	6	1		3		1					1		1												16
Insurance.....	7	7	2	2	3			1	1	2	2				4			1					1	2		35
Law.....	3	3	4	1	3	1					2	2			1	2		1		3					2	28
Mercantile—Agencies.....	1	2		1	1																					5
Physicians and Dentists.....	2	5	3	1	2	3	1		2	1			2		3								1	1		27
Public Utilities.....		1		4								1							1							7
Railroad Offices.....				2		1	1																			4
Real Estate.....	4	1	1	1		2		2		1					2		1									15
Shipping and Exporting.....	1			1						1			1		1										2	7
Wholesale and Sales Offices.....	4	1		4		1	1	2		1		1			2		1		1		1					20
Miscellaneous.....		1	2	1	4					1																11
Totals.....	35	34	21	24	20	12	7	7	3	11	6	6	3	3	16	3	3	2	0	7	0	2	2	1	7	

COMMENTS ON LEGISLATION AND COURT DECISIONS

A CORRECTION

THE EDITOR of the JOURNAL has received the following letter:

DEPARTMENT OF COMMERCE
OFFICE OF THE SECRETARY
Washington

August 4th, 1926

The Editor,
The Journal of Land &
Public Utility Economics,
Northwestern University,
Evanston, Illinois.

Dear Sir:

In the article entitled "Agricultural Contraction versus Expansion as a National Policy" which appears on pages 367 and 368 of the Journal for July, 1926, there is a statement which requires correction. Mr. Hoover has never recommended that "farmers reduce their production to the needs of the home market." The statement referred to was an observation from Mr. Hoover that the growth of population would overtake the production of non-marginal lands and when that situation arrived and increase in marginal lands was required, the farmers' prices would rectify themselves upon a tariff-protected domestic market.

Yours most sincerely,
J. H. WALLIS (signed)
Assistant to Mr. Hoover

This letter was referred to Dr. H. C. Taylor, the author of the article in question, who makes the following statement.

RICHARD T. ELY

The phrase to which objection is made is supported by a statement in an article published under Secretary Hoover's name in the *Pacific Rural Press* of February 7, 1925, under the heading "A National Program for Agriculture," which reads as follows:

Generally the fundamental need is a bal-

ancing of agricultural production to our home demand. We import agricultural produce that we could better produce at home. We export foodstuffs and other agricultural products. Our farmers are caught both ways. They suffer in both directions from competition of cheaper labor and lower standards of living abroad.

The phrase is also supported by an interview published in *Commerce and Finance* for November 18, 1925, in which Secretary Hoover is asked what he means by the stabilization of agriculture and is quoted as responding as follows:

I mean primarily the reduction of our various agricultural surpluses to manageable proportions. I think I can illustrate my meaning by reference to two farm commodities, wheat and corn. Now corn is very nearly in a position of permanent stability because the annual surplus is not so large as to be unwieldy. With the proper development of orderly marketing the corn farmer would never need to be embarrassed by a bumper crop as he has been in the past. The present small excess could be carried over from good years to lean years, and the farmer could achieve an independence from the fluctuations of the world market.

Wheat farming, on the other hand, is still unstabilized because our average annual surplus is too large to be manageable. It makes the American farmer almost entirely dependent upon foreign demand and the vagaries of crop conditions throughout the world. He may obtain a satisfactory price, as in the current season, because of a partial crop failure in this country. But given average crop conditions throughout the world, the American wheat farmer cannot expect to be permanently prosperous as long as our wheat surplus is too large to be manageable. Stability for the wheat farmer cannot be achieved until the exportable surplus is reduced to a basis similar to that of corn.

H. C. TAYLOR (signed)

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